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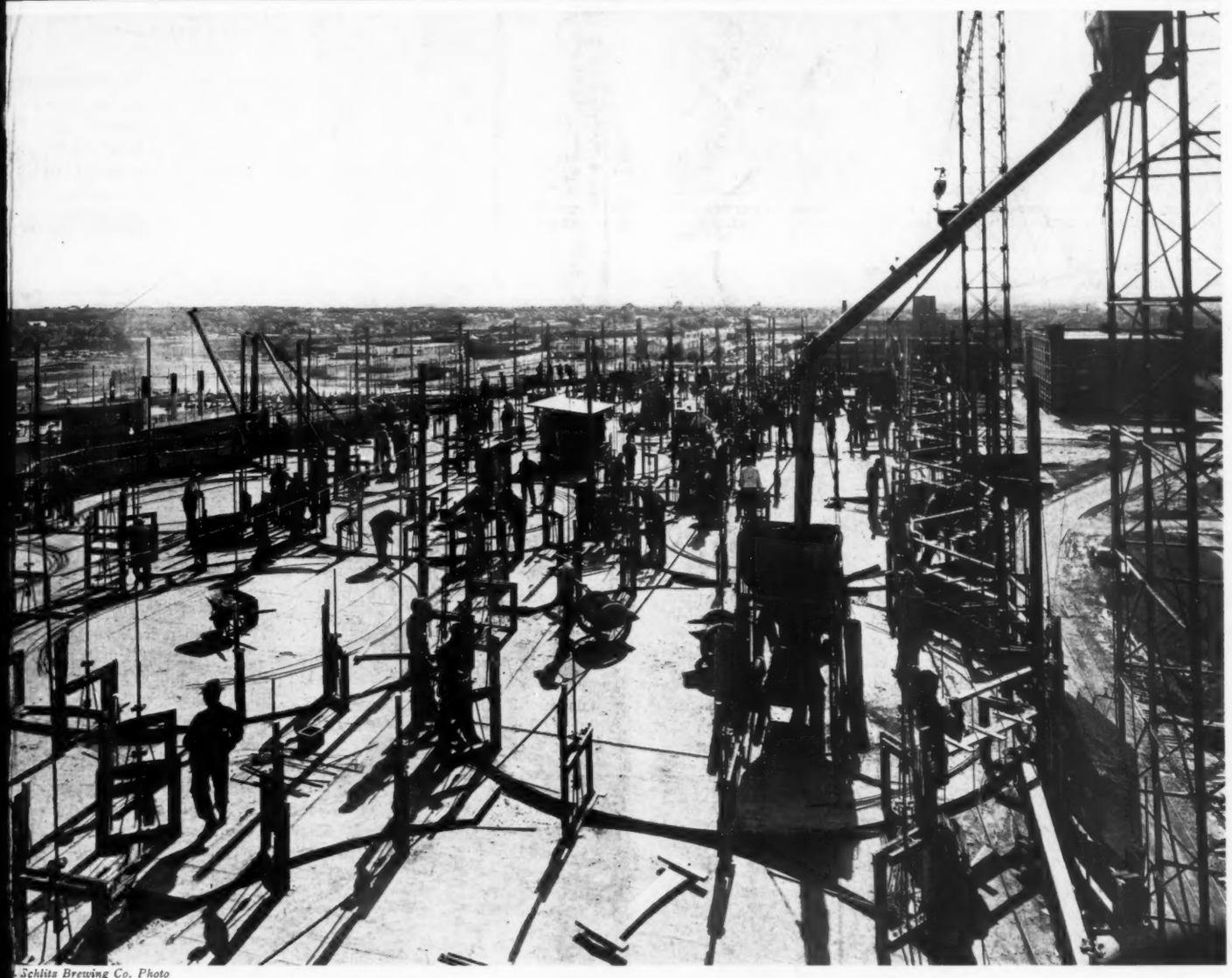
Contracto Engineers Monthly

Vol. 49, No. 7 JULY, 1952 $4 a Year, 50 Cents a Copy



Schlitz Brewing Co. Photo

means of jacks—300 in all—slip forms for a huge Milwaukee grain elevator were raised a fraction of an inch at a time. The work surface you see here is actually the shoring for the bin roof slabs, which was raised with the forms. Turn to page 64 for an account of the Klug & Smith job.

Prestressed Beams for Pier
Mass production catches up with pre-ssed concrete, and contractors turn t 48 pier stringers a day. Page 4.

Road-Test Results
Road Test One-MD netted some inter-ing information about loads. Page 8.

Grading
ive contractors shared a 13-mile road provement, relocation. Page 11.

Light-Work Dredge
The diesel-driven Santee is small but ive. Read how she was built and how e operates. Page 14.

Concrete Paving
A historic spa road in Indiana, plagued floods, was raised 3 feet and given a w culvert. Story, page 18.

Covering the Field

• Bridges
Continuous steel box girders launched from rollers form a Korean bridge. Page 22.

Unusual trestle-bridge rebuilding features a movable overhead detour. Page 76.

• Safety
Read how seriously a contracting firm treats accident prevention on its $6,000,000 air-base job. Page 26.

• Building Construction
Prestressed-concrete beams are features of a one-story school. Page 33.

Slip-form construction was the contractor's means to speedy erection of a grain elevator. Story, pix, page 64.

• Bituminous Paving
A flexible-type pavement of water-bound and penetration macadam with bituminous topping results from a re-location contract. Story, page 38.

• Powerhouse
Cast-in-place concrete piles were driven through river-bottom overburden for a Missouri power plant. Floods delayed the start. See page 42.

• Air-Base
Youngstown, Ohio, Municipal Airport now has a longer runway, and a new apron and taxiway to accommodate U. S. Air Force jets. Read about it on page 48.

• Laying Big Water Main
Low bridges in the Charles River necessitated unusual methods for the contractor who laid a 6-inch water main across the bottom. What he did, page 53.

• County Road Associations
Genesee County, Mich., has a thriving road association. Its services and financing are described on page 61.

• River Lock
Space and river traffic were problems during rebuilding of the Monongahela River locks. Read about the 2-phase contract, page 82. Pix, too.

• Highways Officials Meet
WASHO members threshed out knotty points at Seattle. Report on page 90.

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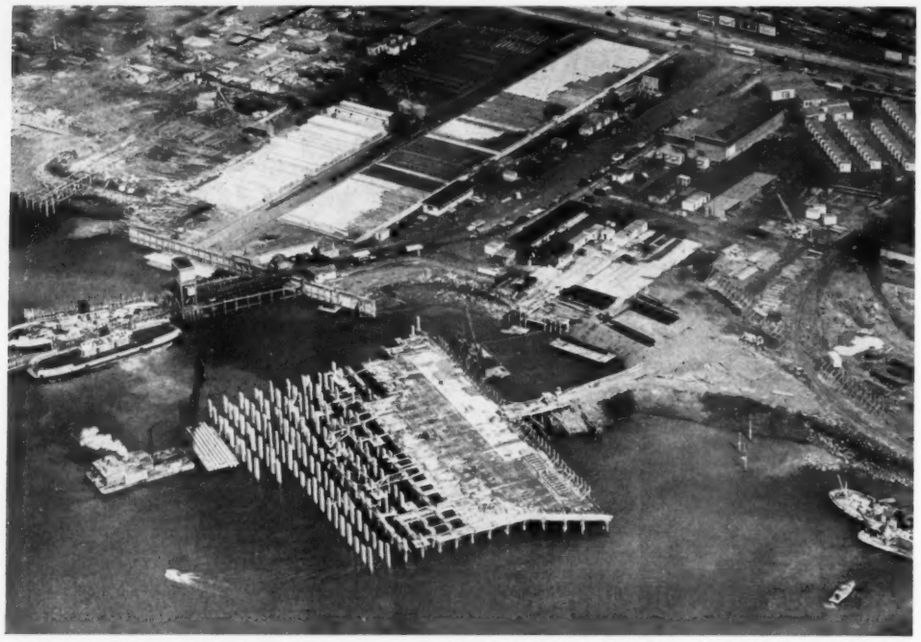


Reinforced-concrete piles are driven for the new Import Wharf at Aukland, New Zealand. Merritt-Chapman & Scott Corp. and Raymond Concrete Pile Co. are the U. S. contractors involved. In the upper center are the pile-casting yards.

NEWS AND VIEWS

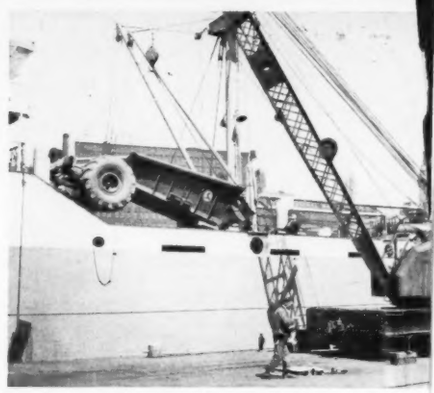
of the construction industry — outlook for materials, review of toll roads

Though not definite at this writing, several **changes in the materials regulations** were slated for this month. In the first place, **NPA planned to lift its ban on recreational construction** and to permit the use of aluminum in all types of building. It also said it would **increase self-authorizations** all along the line: recreational construction—5 tons of carbon steel (2 tons of structurals), 200 pounds of copper, and 250 pounds of aluminum per quarter . . . schools—50 tons of carbon steel (7 tons of structurals), 1,000 pounds of copper, and 1,000 pounds of aluminum per project . . . roads—25 tons of carbon steel (12 tons of structurals) and 200 pounds of copper per project . . . chemical plants—2,000 pounds of stainless steel per project per quarter. By October, NPA also hopes to increase self-authorizations for general commercial construction to 25 tons of carbon steel (no limit on structurals), 750 pounds of copper, and 1,000 pounds of aluminum per project per quarter.

While we're looking ahead, did you see Commerce Department's **rosy estimates of the future for construction?** Volume this year $39 billion, it predicts, with $30 billion of that for new construction and the rest for maintenance. It also foresees a possible 20 per cent rise in that figure over the next 10 years. Population increase one of the big reasons, since it leads to new and expanded community residential developments, which in turn lead to more commercial and municipal construction, highways, sewers, waterworks, schools, churches, retail outlets, etc.

National Motor Bearing Co. Photo

Graders, pavers, finishers? Phooey! Not when an artist turns off Captain Video and sits down to sketch a futuristic machine laying 30 miles of highway a day. You and I may never see one, but you'd better alert the kids.

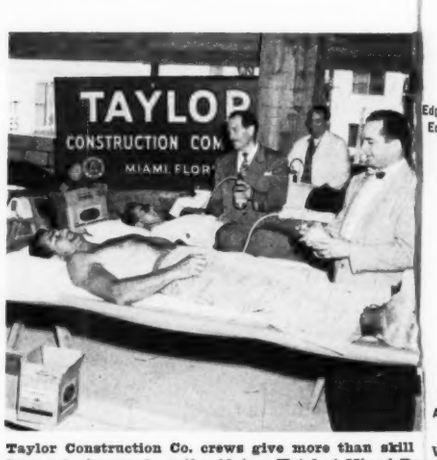


A 20-ton-capacity Euclid bottom-dump is loaded onto the Dutch ship Prins Frederick Hendrik in the Great Lakes. It will participate in the construction of Mauvoisin Dam in the Pennine Alps, Switzerland.

None of this, however, is any encouragement to contractor L. A. Blair, who writes us: "Please cancel subscription for Blair Construction Co. Cedar Creek, Nebraska, for the following reasons: Regulations — Labor — Tired — **So quit business and am going fishing.**

Now there's a man with the right idea. A few figures on toll roads and we'll join him — for the afternoon, anyway.

Did you know that the nation's prewar mileage of **toll roads** was 346.6 . . . that since the war 1,479 miles have been completed, are now building, or will start this year, involving a total investment of $1,698,300,000 . . . that of the 362 miles completed since the war at a cost of $435.3 million, Colorado accounts for 17 miles at $ million . . . Maine, 45 miles, $20 million . . . New Hampshire, 15 miles, $7.5 million . . . New Jersey, 118 miles, $255 million . . . Pennsylvania 167 miles, $164.5 million. As for work in progress, New York accounts for 535 miles at $ million and Oklahoma for 88 miles at $38 million. Scheduled for starts this year are 165 miles in New Jersey at $285 million . . . 241 miles in Ohio at $326 million . . . and 88 miles in West Virginia at $96 million. Additional toll-road projects are being talked in California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, North Carolina, New Jersey, Oklahoma, Tennessee, Texas, Utah, Virginia, West Virginia, and Wisconsin.



Taylor Construction Co. crews give more than skill and brawn during work on the Algiers Hotel at Miami Beach, Florida. They give their blood, too, right on the job, to Mount Sinai Hospital's Blood Bank.

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Local Initiative, Not Federal Aid, for Highways

"Our dollar is in far worse shape today than any of our roads", said Harold F. Hammond, Manager of the Transportation Department of the Chamber of Commerce of the United States, in answer to those who are pressing for an increase in Federal Aid to highways. To a large degree Federal deficit spending has brought about this dollar condition, he said.

Speaking at the Fourth National Highway Transportation Congress meeting in Washington, D. C., last May, Mr. Hammond stressed that the Chamber of Commerce is well aware of the need for modernization of the country's highways and is actively encouraging highway improvement. But increased Federal Aid means more red tape and domination by Washington. It is the state and local bodies who should take the initiative, he declared.

Mr. Hammond's proposed solution is that the motor-vehicle industry, the road-building industry, the highway-user industry, and other similar groups should get together through such an organization as Project Adequate Roads Committee and set up a national highway-financing study which would provide the answers to who should pay and how much, in order to build the good roads the country needs so badly.

Accidents don't happen; they are caused. Remember: safety always pays.

Wisconsin remodels highway for today's traffic

The old pavement was rough and too narrow

Laying new Texaco Sheet Asphalt pavement

What happened to this section of Wisconsin's Trunk Highway 190 is typical of the fate of highways throughout the country. Traffic has increased to a 24-hour count of 20,572 trucks, buses and automobiles. The old pavement became rough and uneven under its steadily mounting load and it was no longer wide enough to accommodate traffic.

Wisconsin has remodeled this section of Route 190, also known as East Capitol Drive in one of Milwaukee's suburbs. Now serving its traffic is the wide, smooth, resilient Texaco Sheet Asphalt pavement shown in the bottom photograph. A new base was constructed under most of the Texaco Asphalt surface, except where the existing pavement was found suitable to serve as base. Each side of the divided highway was widened from 28 to 34 feet. The Sheet Asphalt pavement was laid in two courses, a 1½-inch binder course and 1-inch top.

The asphalt used in this important Wisconsin highway project was a 60-70 penetration Texaco Asphalt Cement. Throughout the United States during 1952, other road builders are choosing Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils for heavy-duty, intermediate and low-cost types of construction. These Texaco-surfaced roads and streets will be called upon to serve under traffic and climatic conditions of every type. Whatever the project, there are two facts which assure its satisfactory performance at low annual cost: (1) The Texaco Asphaltic material used in its construction is the product of almost half a century of asphalt refining experience; and (2) Texaco Asphalt products are refined from scientifically selected crudes.

How the same highway looks today

Faithfully yours 50 for Fifty Years

Two helpful booklets which describe all types of Asphalt construction for streets, highways, airports, etc., can be obtained without obligation by writing our nearest office.

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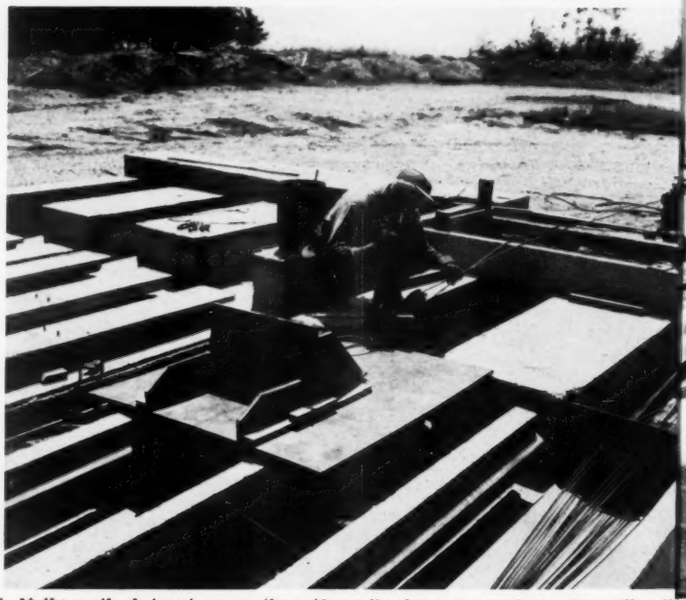
TEXACO

TEXACO ASPHALT

1. At a signal from a workman, prestressing wire unreels from this spindle platform to be locked in a steel guide and winched down to the south abutment of the casting bed.



2. At the south abutment we see the guide on its sled and a workman dismantling th line from the Joy-Sullivan winch which pulled guide and wires from the north en

3. Stil

C. & E. M. Photos

Prestressed Pier Stringers

Contractors Turn Out 48 Pretensioned Stringers Every Day For Main Deck of New York's Pier 57

By ALBERT C. SMITH,
Associate Editor

• THE future of prestressed concrete in the United States is looking quite a bit brighter this summer, thanks to a couple of contractors who aren't afraid to try a new stunt or two. Using mass-production techniques, plus a number of gadgets and gimmicks of their own devising, Merritt-Chapman & Scott Corp. and Corbetta Construction Co. are turning out 48 pretensioned concrete stringers every day of the week.

On this part of the huge new Pier 57 project for New York City, the joint-venture contractors are really making prestressing pay. Every day sees another batch of the 20-foot stringers completed. By the end of summer, over 3,000 will be ready to support the main deck of the new pier.

Both the box-type concrete-pier foundation and the prestressed stringers are being built in and around a drained pond just a few feet from the Hudson River in Haverstraw, N. Y. The pontoon-type boxes, which will act as a buoyant substructure for the ultra-modern pier, will be floated down the river to the city this summer.

The I-shaped stringers will abut lengthwise to support a loading of 600 pounds per square foot on the main deck of the pier. Their top flange is 14 inches, the bottom one is 18 inches, and they are 12 inches high. Every stringer is placed in compression by 30 wires, each 0.192 inch in diameter. The wires are spaced 1½ inches on center and set in a general triangular pattern.

Mass Production

Like any good mass-production system, the one M-C&S and Corbetta are using calls for performing the same operations every day. Before the pretensioned wires can be cut, the concrete must attain a strength of 4,800 psi. This requires 3 days of curing, so the contractor set up 4 parallel casting beds to permit one complete pour every day on one bed.

The casting beds are 5-inch concrete slabs reinforced with steel mesh. Each bed is about 10 feet wide and 350 feet long, with post-tensioned concrete abutments at each end to absorb the load. Three lines of 16 beams each are poured on each bed.

The daily sequence of operations goes like this: At the beginning of each day, the concrete side forms are stripped from a previous pour by sliding them away from the stringers on a system of steel pipes and brackets. A special hand bar with a hook at the base fits into a slot in the bracket and pulls the form away as it slides on a greased pipe. This operation takes less than an hour.

As the forms are stripped, the pre-tensioned wires are burned through between each stringer. At that point the stringers become prestressed. The 20-foot units are then loaded by crane onto a truck and stored on the site. After all have been removed from the bed, a spindle platform riding on steel rails is moved up in line with the first row of 16 open forms. One wire from each of 30 reels is pulled out by hand and locked in a steel guide riding on a sled-type wooden cart.

An engineer works a Joy-Sullivan winch mounted on rails at the south end of the bed to pull the sled and the 30 wires to the south abutment; he gets flag signals from a worker on the spindle platform. The Super-Tens uncoated wires, supplied by American Steel Wire Co., are divided into three groups of 10 each and fed through holes in the abutment. Before any jacking is done, the 30 wires in each

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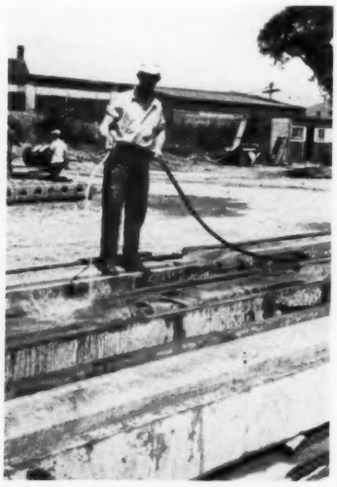
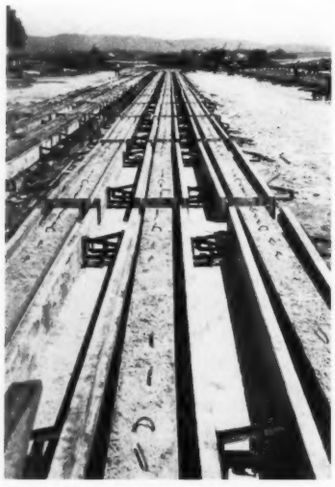
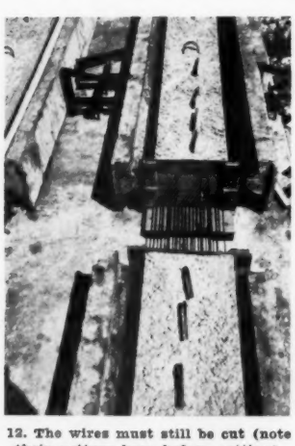


9. Curing consists of keeping the stringers wet 24 hours a day for 3 days.

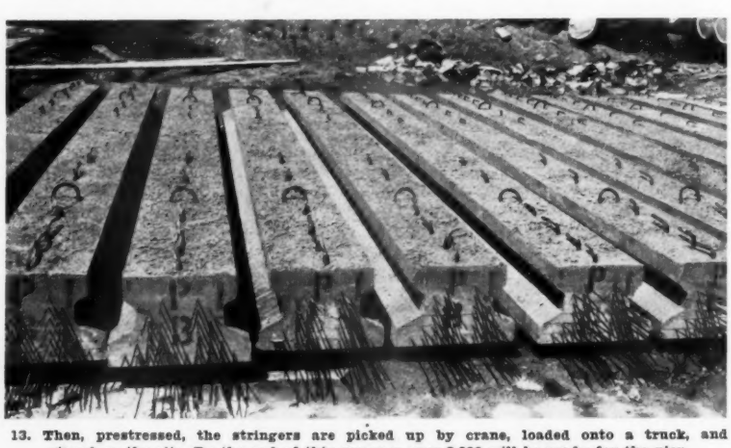
10. Stripping means simply sliding the side forms back on a pipe-and-bracket system.



11. And in less than one hour 48 stringers, a day's work, are in the clear.

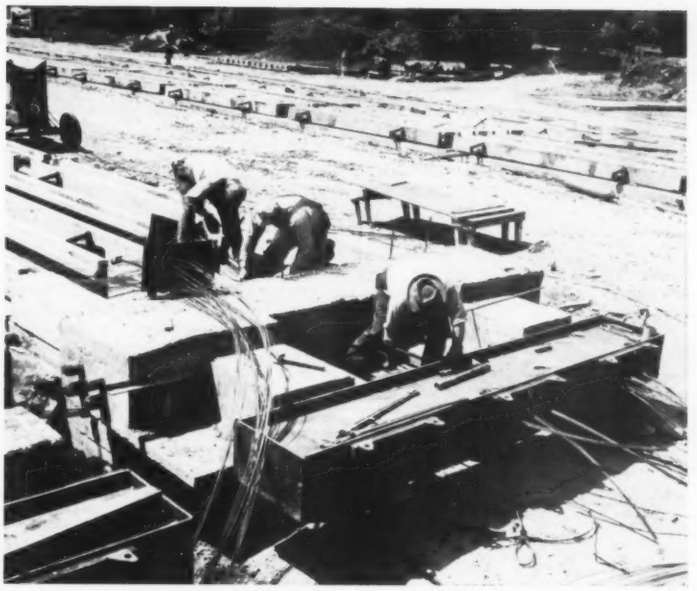


12. The wires must still be cut (note their pattern here before cutting).



13. Then, prestressed, the stringers are picked up by crane, loaded onto a truck, and stored on the site. By the end of this summer over 3,000 will be ready for the pier.

3. Still at the south abutment, the 30 wires in the center row will now be bunched together and taped every 10 feet to prevent unequal tension as they are pulled.



4. At the north or jacking end, workers feed the wire through the concrete abutment and the steel jacking beam. Note the transverse prestressing cones in the side.

Mass-Produced

row are bunched together and taped every 10 feet to prevent slack and unequal tension as they are being pulled all together.

The wires at the north end are then snipped, set in a steel guide, separated into groups of 10, and fed through holes in the north concrete abutment and into a steel jacking beam made of I-beams and plates and riding on rollers. Jacking is done at this end when the big jacking beam, holding the locked wires, is pushed away from the concrete abutment.

At this point in the process the taped groups of 30 wires stretch the full length of the 16-beam trough on the plastic-coated plywood bottom form. At each end the wires are set in steel guides; at the south end they stick out from the abutment, and at the north end they stick out from the jacking beam.

Locking the Ends

The next step is to lock each group of 10 ends in a Freyssinet cone to prevent slipping when the wires are stretched. A Blackhawk hydraulic pump and jack is used to force the inner cone against the wires and the outer cone. At the south end the jack bucks up against a reinforced-concrete block, and at the north, where working space prevents the use of a block, the jack bucks up against a portable steel frame.

At this stage, the wires are locked at each end and the main jack is ready to begin pushing out the jacking beam and stretching the wires. The pump is now connected to a 2-inch air line, the piston begins to reciprocate, fluid forces the two 6-inch pistons out against the jacking beam, and the wires get their first taste of the 225 tons to come.

After some initial tension has been set up, the jacking is interrupted and the tape removed from the wires. At the same time, the bottom row of 10 wires is set in a wooden strip with slots on the top edge to keep the wires in their proper place during stretching. As more tension is added, more wooden strips are added until all 30 wires are set in the correct pattern.

The pump resumes its push and the full load of 225 tons is applied. Each wire is now holding 5,000 pounds. To maintain this tension during the 4-day curing cycle, steel-pipe struts with plates welded at the ends are moved in between the north concrete abutment and the jacking beam. The jacking apparatus is then lifted out and set in the adjacent block for the next day's operation.

Pouring

The steps described so far have taken half a day. The remaining half is used for pouring. Truck mixers from the nearby batch plant chute the rich 6,000-pound concrete into a bucket, which is lifted by a crane and dumped over and around the straining wires. The concrete is vibrated internally with a Mall vibrator. Dowels are set in the top to bond with the future slab. Burlap is laid over the top and the stringers are kept wet 24 hours a day for 3 days.

Thus the entire operation—stripping and moving the finished beams, feeding and jacking the wire, and pouring—takes one day. Moreover, 48 new beams become ripe the next day.

Working Layout

The working area for this mass-production prestressing is a 1-acre plot just a few feet from the bank of the Hudson and near the construction site of the Pier 57 pontoons. After some preliminary grading the site was covered with traprock to provide drainage under and around the casting beds.

There are two 350-foot beds on the east side of the plot and two on the west side. Each pair is close together and slightly staggered, to provide plenty of working area in between and around each bed.

The massive concrete jacking abutments are unique in many respects. They provide a seat for the stressing apparatus, act as a guide for the wires, and absorb the 225-ton load. They are used on each end of the bed, although the stressing is done only at the north end.

Basically they consist of a 5-foot-deep x 12-foot-wide block tapering in two beams to a 1½-foot slab where the abutment meets the bed. The lower part of each tapered beam is placed in compression by 30 post-tensioned wires. The main block is also compressed transversely with 30 wires. The tapered feature transmits most of the jacking load into the ground, although a certain amount does go into the casting bed.

Concrete Side Forms

Another feature of the job is the

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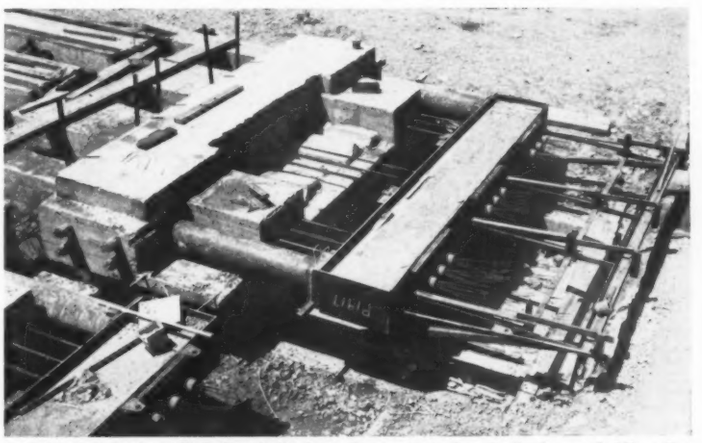
5. With the aid of a Blackhawk jack, the wire ends are locked in a Freyssinet cone.

6. Now Watson-Stillman jacks force the beam away from the abutment.



7. With full load applied, the jacks have been removed and struts are holding the tension. The jack supporting frame shown at the right is no longer used.

8. Now, with initial tension on the prestressed wires, a workman oils the concrete side forms. He is using a metal shield to protect the wires.

Prestressed Stringers Mass-Produced Daily

(Continued from preceding page)

use of concrete side forms. Merritt-Chapman & Scott and Corbetta figure that getting 20 re-uses from each form will justify the large first cost. In addition, the simple system of sliding them back and forth into position greatly cuts down on labor time.

The side forms are generally rectangular, with a projection on one face forming the web of the stringer. They were fabricated in wooden forms on the site, and were reinforced with three ⅜-inch round bars. A Jaeger ½-yard mixer mixed the concrete and chuted it down into the forms. Two Yale hand chain hoists suspended from an overhead gantry did the stripping and moving. When fully cured, the forms were carried out to the casting beds, fitted with steel brackets, and set up for pouring.

Sliding Bracket

Every form has a steel bracket at each end. These brackets are made of angles and are welded to a short stub of 1½-inch pipe running parallel to the form. Bolts hold the bracket to the form. To get the forms to slide back and forth easily, 1-inch greased pipes are set under the plywood base forms. They project out away from the beam and act as rails for the 1½-inch pipe stub and the bracket to ride on.

A piece of angle bolted to the bed keeps the bracket in position when the form moves. When a workman wants to move a form, he sets a steel pole with a hooked end into a slot on the bracket. He drops the hooked end over one of the bolts coming out of the bed, and then simply pulls back on the top. The pole acts as lever, using the bolt as a fulcrum and the slot as the load point, and the form moves away with very little effort.

During pouring, a welded pipe brace is dropped over the top of the form to prevent movement outward. These bracket devices, all turned out by quick welding at the site, make it simple to set the forms, line them up, brace for pouring, and strip.

Spindle Platform

Another welded device made up on the site is the spindle platform. The 20 x 20 wooden table is set on steel beams which ride on four rollers and two steel rails. Fifteen horizontal spindles on top carry two reels each and are set in four rows. Once again M-C&S and Corbetta showed their welding ingenuity by turning pipes and plates into a cheap but effective machine.

The main shaft of each spindle is a 1½-inch pipe welded to a steel base plate. The bottom reel of wire is set on four horizontal pipe arms which are welded to a vertical 2-inch pipe. This unit revolves over the 1½-inch pipe shaft. A steel plate welded to the bottom of the 2-inch pipe rubs against the base plate, preventing the spindle from gaining too much momentum while unreeling. The top reel is the same, and is set on a spike run through a hole in the 1½-inch pipe shaft.

Portable Bucking Frame

Another job-made time-saving device is the portable steel bucking frame used to jack the Freyssinet cones into the jacking beam at the north end. Because working space is needed for the main stressings, a concrete block could not be used to buck against the Blackhawk jacks. Consequently the contractor welded several steel bars to a standard rail and fitted the bars with four pad eyes. Similar pad eyes were welded to the jacking beam. The bucking unit is carried to the beam, set over the pad eyes, and secured with four pins. One end of the jack is then set against the inner cone, the other end against the rail in the frame, and the cone is pushed in a matter of seconds.

The main jacking system consists of two 6-inch Watson-Stillman jacks and a Union steam pump powered by an Ingersoll-Rand air compressor. The pump is giving good service, though the contractor estimates that it is about 50 years old.

Personnel

Leonard E. Ott is Project Manager for the contractors. John Tantillo is General Superintendent and Walter Campana is in charge of reinforcing-steel work. Theodore Charvat was in charge of setting up the casting yard and is also responsible for designing many of the time-saving gadgets.

Resident Engineer for the New York City Department of Marine and Aviation is R. C. Wood. C. R. Barrett represents Madigan-Hyland, the consulting engineer.

FINEGRADER — Fast, Flexible, Most Economical

The Motor Grader illustrated above is equipped with moldboard extensions and Roadgrader Gauges and is shown finegrading a 25-foot wide lane on an airport project.

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- Micro-fine, Positive Adjustment Working Ranges From 3'4"—15'
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- No Extra Attachments Required for Operation—Self Contained Unit
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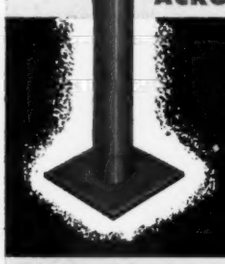

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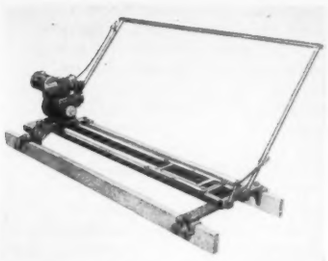


Feature of the new Whiteman screeds is a telescopic frame. One model adjusts from 3 to 15 feet wide; the other, from 6 to over 20 feet.

New Screeding Unit Has Telescopic Frame

A telescopic frame is one of the features of two new screeding machines introduced by Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 39, Calif. Model RS-11 will screed slabs as narrow as 3 feet and expand to screed slabs 15 feet wide. The heavy-duty Model 52-15 adjusts for slabs from 6 feet to over 20 feet wide.

Mounting the engines at the end of the machines instead of in the center has eliminated the sag of screed sticks, according to Whiteman. The machines, the company points out, thoroughly vibrate and puddle concrete throughout its entire depth without heavier aggregates settling to the bottom. Moisture is brought to the surface and the slab is screeded level to prepare for floating and finishing. Attachments are available for overhead screeding.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 395.

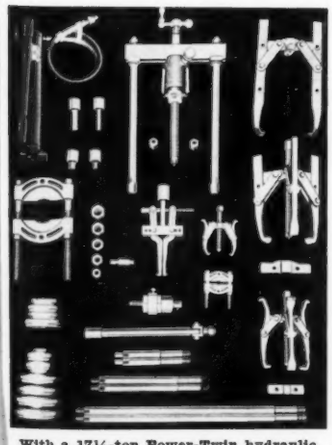
Masonry Drill Bit

A carbide-tipped masonry drill bit for use with electric or pneumatic hammers is manufactured by New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass. The Thunder-Twist has two deep spiral vanes which remove dust and reduce packing or binding of the bit. It drills holes 3/16 to 1¼ inches in diameter, to 36 inches deep. Available lengths are 3, 4, 6, 12, 18, and 24 inches. Special diameters, shanks, or extra-length bits can also be furnished.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 301.

Tractor Service Set

A new set of International-tractor service tools which convert all existing International sets to hydraulic power is announced by Owatonna Tool Co., 381 Cedar St., Owatonna, Minn. With the 17½-ton hydraulic ram, it contains the minimum assortment of pullers, adapters, and attachments essential to service International tractors.



With a 17½-ton Power-Twin hydraulic ram, this Owatonna tool set will service all International wheel tractors.

The hydraulic ram does the pulling and installing operations involving gears, bearings, sleeves, pulleys, shafts, sprockets, bearing outer races, bushings, etc. With its center-hole construction, it is said to eliminate torque, broken tools, and parts, and to do the job 75 per cent faster than screw-operated pullers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 285.

Folder on Heavy-Duty Gears

A new folder describes the part played by S-N heavy-duty reduction gears in such construction applications as bridge raising, pumping, dredging, quarrying, ditching, and sand-pit dragging. It also illustrates the designing, manufacturing, testing, and inspecting of gears.

This literature is available from Snow-Nabstedt Gear Corp., 222 Welton St., Hamden, Conn., or by using the Request Card at page 16. Circle No. 316.

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How Axle Loadings Affect Concrete Roads

Findings in Road Test One-MD Show That Double Weight Does More Than Double Destruction

• APRIL of this year marked the real end of a big highway research project—Road Test One-MD. For it wasn't until then that the data compiled during the test, including 6,000 soil tests and 12,000 strain and deflection readings, were completely analyzed.

Nature of Test

The purpose of the test, you will remember (see C. & E. M., September, 1950, pg. 10, and April, 1951, pg. 4) was to determine the relative effects of four different axle loads on a concrete pavement. For six months, 7 days a week, 24 hours a day, 50 minutes every hour, trucks of four different loads shuttled back and forth along four separate sections of the 1.1-mile test strip south of La Plata, Md. Every crack that showed up on the 12-foot portland-cement-concrete lanes was painted and recorded on a chart. Electronic recorders measured deflection and stresses and strains along the edge of the slab and at the joints. Soil samples were taken from open trenches along both edges of the pavement and from 128 core holes drilled in the pavement. Maintenance during the six months of the running tests, from June through December, 1950, consisted of joint sealing (11 times) and shoulder blading (23 times).

The pavement itself consisted of two 12-foot lanes each having a 9-7-9-inch cross section, both reinforced with wire mesh. Expansion joints were spaced at 120-foot intervals with two intermediate contraction joints at 40-foot spacings. All transverse joints had dowel bars ¾ inch in diameter at 15-inch spacing and the adjacent lanes were tied together with tie bars 4 feet long spaced at 4-foot intervals.

The major test findings were these: a 22,400-pound axle load cracked the slab 6.4 times more than an 18,000-pound axle load; 44,800-pound tandem-axle loads caused 12.3 times as much cracking as 32,000-pound tandem-axle loads. In other words, twice as much load caused more than twice as much damage.

Following, in somewhat more detail, are the results of the soil and the strain and deflection tests.

Soil Tests

A silty clay of the A-6 soil group was the predominant soil underlying the test road. Since it occurred extensively as a subgrade for all four test sections, it enabled comparisons between single- and tandem-axle loads on the basis of pavement performance (though single-axle loads were applied 1.5 times more than tandem-axle loads during the test, and this fact should be borne in mind).

1. The progress of cracking and depression of the joints and edges of the pavement was definitely related to the occurrence of pumping.

2. The average amounts of cracking per slab (40 feet long, 12 feet wide) were as follows for the period ending October 13:

Truck Load	Truck Applications	Cracking (in linear feet)
18,000-lb. single axle	152,876	None
32,000-lb. tandem axle	92,363	4
22,400-lb. single axle	146,332	13
44,800-lb. tandem axle	92,166	50

For the period ending December 23:

18,000-lb. single axle	238,281	4
32,000-lb. tandem axle	164,523	15
22,400-lb single axle	238,263	28
44,800-lb. tandem axle	Discontinued October 13	

3. The linear feet of cracking was markedly greater in the vicinity of expansion joints than at contraction joints.

4. Cut and fill sections were about equally susceptible to pumping, but the average amount of cracking per slab was greater in cut than in fill sections.

5. Under the continued action of loads operating on all four test sections from June 23 to October 2, the joints of the slabs laid on A-6 soil were depressed an average of 3/16 inch on the 18,000-pound-axle load lane, ¼ inch on the 32,000-pound lane, ⅜ inch on the 22,400-pound lane, and ⅞ inch on the 44,800-pound lane.

6. The occurrence of pavement pumping and cracking under the 18,000-pound single-axle load in sections laid on A-6 soil showed that the combined supporting ability of the pavement and subgrade in these sections was slightly less than adequate for the axle load of 18,000 pounds applied in the test frequency (an average of 1,319 per day). In combination with subgrade support of identical character, the pavement was substantially inadequate for the 22,400-pound single-axle load applied in the same frequency. Laid on this same class of soil the pavement proved to be less adequate for the 32,000-pound tandem-axle loads (average rate of application 910 per day) than for the 18,000-pound single-axle loads, and substantially less adequate for the 44,800-pound tandem-axle loads (average rate of application 884 per day) than for 22,400-pound single-axle loads.

It should also be noted that where subgrades were nonplastic granular soils (A-1) with less than 9 per cent passing the No. 200 sieve, there was no pavement pumping or cracking for either single-axle load. Where more than 9 per cent passed the No. 200 sieve there was slight pumping but no cracking under the 22,400-pound single-axle load.

(Concluded on next page)

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Here's the light-footed, heavy-handed, all-round performance that means less time and lower costs on 101 different jobs — near and far! It's the MITI-MITE — sensational new machine for truck service — it brings you 100% automotive design — and an amazing new idea in power application.

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Strain, Deflection Tests

1. The magnitude of induced stress and pavement deflection decreased progressively with increase of vehicle speed. The stress and deflection resulting at 40-mph vehicle speed averaged approximately 20 per cent less than the magnitudes recorded at creep speed.

2. The magnitude of stress and deflection at the outside edge of the pavement was progressively reduced by increase of distance of the wheels from the edge. With the wheels at 30 inches from the edge, the magnitude of edge stress and deflection was approximately 50 per cent of the magnitudes recorded with the wheels 6 inches from the edge.

3. Stresses measured in a typical slab laid on the granular nonpumping subgrade soil were well below design limits (50 per cent of the modulus of rupture) for all four of the loads frequently applied in the tests, and even for the heavier loads applied only for purposes of stress measurement. The maximum stresses measured in this slab were those resulting when the loads were applied at creep speeds. The deflections were also very low for all the loads.

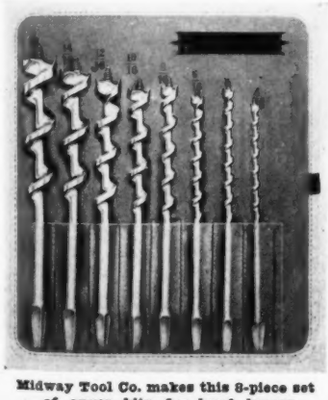
4. The failure of slabs laid on the fine-grained soils is explained by the fact that deflections of these slabs under all of the test loads were sufficient to cause pumping. As pumping developed, the deflections increased (more rapidly under the heavier than under the lighter loads), with correspondingly more or less rapid increase of stress to a magnitude sufficient to cause rupture of the slab. This is shown by the relationship between the time when the first pumping was observed and the occurrence of the first cracking for the different axle loads on the A-6 soil. For the 18,000-pound single-axle load the interval between first pumping and the occurrence of the first crack was 99 days or 118,000 truck applications; for the 22,400-pound single-axle load (excepting a crack which occurred before pumping was observed) the interval was 23 days or 27,000 truck applications; for the 32,000-pound tandem-axle load this interval was 27 days or 25,500 truck applications; and for the 44,800-pound tandem-axle load this interval was only 6 days or 6,500 truck applications.

The Highway Research Board, which directed the test on behalf of the cooperating states, will publish a final report on it in the near future. The foregoing summary is based on one prepared by HRB Director Fred Burggraf, and published as Circular No. 50 by the National Sand and Gravel Association, 1325 E St., N. W., Washington 4, D. C.

Set of Auger Bits

A new 8-piece set of auger bits for hand braces is announced by The Midway Tool Co., Inc., Melvin, Ohio. The Mirbrite Master Bit-Kit (No. 50-8) contains one each of 4/16, 5/16, 6/16, 8/16, 10/16, 12/16, 14/16, and 16/16-inch bits. Sets with 5, 6, 8, and 13 pieces and a 5-piece set for electric drills are also made. All Bit-Kits are packaged in blue plastic roll cases and bit compartments are individually labeled for size.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 277.

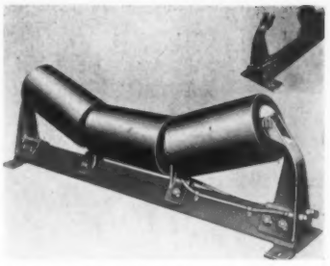


Midway Tool Co. makes this 8-piece set of auger bits for hand braces.

New Troughing Rolls

A new heavy-duty grease-type troughing roll assembly for belt conveyors features simplified greasing from one side, Timken bearings, and self-cleaning mounting brackets. It was developed by Universal Engineering Corp., 620 C Ave., N. W., Cedar Rapids, Iowa.

The simplified greasing of all bearings from one side eliminates the necessity for a walkway on both sides of the conveyor. Greasing is accomplished through accessible fittings, with flexible automotive-type grease tubing carrying the lubricant to the middle bearings and those on the extreme end. The tubing is designed to take high grease-gun pressures. It withstands rough handling during shipment, and, because of its flexibility, breakage due to vibration is eliminated, according to the company.



Greasing can be done from one side on this Universal troughing roll-assembly for belt conveyors.

The troughing rolls are mounted on self-cleaning brackets inclined at a 2½-degree angle toward the flow of material to keep the conveyor belt in alignment. Extreme end bearings are protected by steel guard shields, preventing damage from material dropping off the belt and jamming between the troughing roll and the end bracket. Universal grease-type troughing rolls are available in 5 and 6-inch diameters, and in 18, 24, 30, 36, and 42-inch widths.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 315.

"On schedule" on the Turner Turnpike

Hustling, burly "Caterpillar" DW21 Tractors are ironing out the wrinkles in the Oklahoma landscape for a high-speed highway *on schedule*. The Turner Turnpike, slated for completion in December, will run 88 miles from Oklahoma City to Tulsa.

When finished at an estimated cost of $26,900,000, the turnpike will have two 24-foot lanes separated by a 15-foot raised median. The highway, built *for* speed, is being built *with* speed. A fleet of five "Cat" Diesel DW21 Tractors with matching scrapers are moving dirt from cut to fill for S. E. Evans Construction Co., Oklahoma City, Okla. Reports Orvil Cranfill, superintendent of S. E. Evans:

"With 2,000,000 yards of dirt to move, we are moving more than 1,200 yards daily with each machine. We are surely on schedule."

The barrel-chested "Cat" No. 21 Scrapers are push-loaded on the job in about one minute. They spread on the run smoothly and evenly in 20 seconds. Carrying an average load of 22 yards, they whip through 9 to 10 trips an hour each with an average haul of 1,500 feet. Peter Kiewit Sons Co., Omaha, Neb., another turnpike contractor, also is using the swift, efficient DW21 unit.

By design this big yellow team insures quick action. Precision engineering, premium materials, anti-jackknife devices, large brakes, and big capacity eliminate down-time and keep you on schedule.

"Caterpillar" means speed; speed means money. Your "Caterpillar" Dealer can show you how to step up your construction pace. No matter what your earthmoving job, he has equipment which is the right size to do it quickly and efficiently.

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Bulletin on Excavator With Telescopic Boom

Details of a truck-mounted excavator with a telescoping boom are presented in a new bulletin issued by The Warner & Swasey Co., Carnegie and Stilwell Ave., Cleveland, Ohio.

The Gradall's all-welded boom with 3 tubular members can be extended 12 feet to a total length of 24 feet from the pivot point. It can be raised to a 22-degree angle, lowered to a 44-degree angle, and tilted 45 degrees each way from the horizontal. The rotating platform permits a horizontal travel of 360 degrees in either direction.

The company points out that the unit can be used for trenching, excavating, backfilling, chamfering, ditching, and grading. The bulletin illustrates each operation.

This literature may be obtained from the company, or by using the Request Card bound in at page 16. Circle No. 354.

U. S. Plywood News

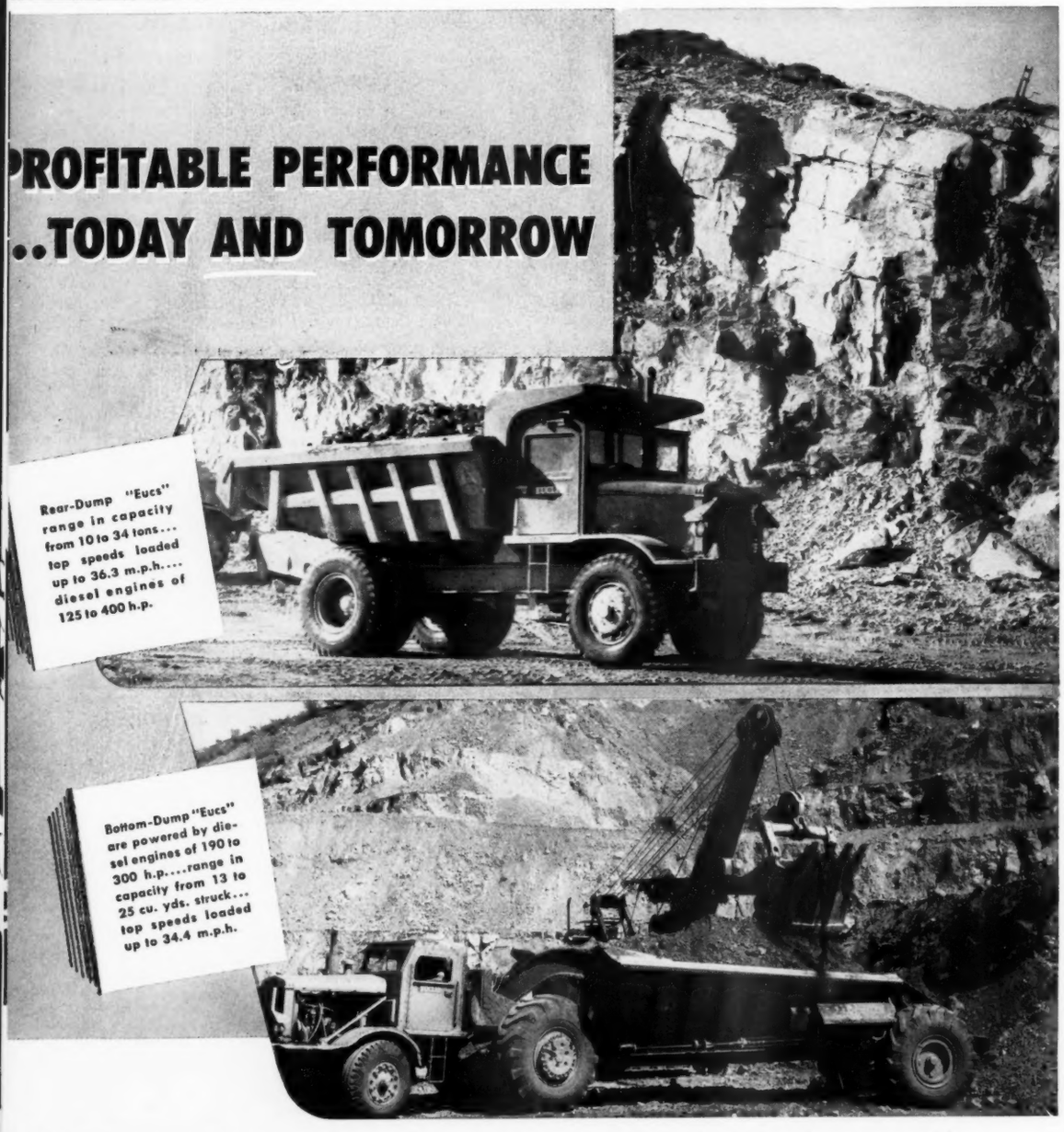
United States Plywood Corp., New York, N. Y., announces the appointment of three new sales heads in the New York City area: Jerry Kayne, formerly Sales Manager in New Hyde Park, Long Island, is Manager of the Company's Brooklyn-Queens distribution plant at 89-17 Union Turnpike, Glendale. I. E. Jatlow, former Sales Manager at the Newark, N. J., distribution plant, succeeds Mr. Kayne in New Hyde Park. And Herbert Tepe is the new sales head at Newark.

Turning from sales news to research and development, Raymond C. Platow, formerly of Bell Telephone Laboratories, has joined U. S. Plywood as Chief Materials Engineer; and the company opened its seventh research laboratory last spring, in New York City.

Centenary of Vulcan Iron

The first 100 years have been full ones for Vulcan Iron Works, Inc., Chicago, Ill., manufacturer of pile-driving and extracting machinery. Founded in 1852 by Henry Warrington, the original factory boasted 20 employees and its early business was confined to the production and development of drop hammers and their leaders, bridge machinery, and public improvements such as fire hydrants and manholes. Four generations of the Warrington family have been active in the firm over the past 100 years, and it was not long before the Warrington of the day decided to drop most of his early interests in favor of the firm's newly patented single-acting steam-powered pile-driving hammer. Successive developments of this hammer followed through the years, and it was joined by a pile extractor and a double-acting pile-driving hammer.

Vulcan, which now concentrates entirely on pile-driving equipment and accessories, is the oldest and one of the largest manufacturers of this type of equipment in the country.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..TODAY AND TOMORROW
Rear-Dump "Eucs" range in capacity from 10 to 34 tons... top speeds loaded up to 36.3 m.p.h.... diesel engines of 125 to 400 h.p.
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Euclids are engineered and built for long life and dependable performance in off-the-highway service. Their rugged staying power is a major factor in assuring low cost production on a wide range of jobs.

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INDIANA—Euclid-Chicago Co., Chicago 31, Illinois.
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IOWA—The Euclid Road Machinery Co., Hibbing, Minnesota.
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NORTH CAROLINA—Hampton Roads Tractor & Equipment Co., Norfolk, Virginia.
North Carolina Equipment Co., P. O. Box 880, Greenville; Pineville Rd., Charlotte; Sweeten Creek Rd., Asheville; P. O. Box 128, Guilford; P. O. Box 685, Wilmington.

NORTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

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RHODE ISLAND—Clark-Wilcox Co., Boston 34, Mass.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 188 E. Butler Ave., Memphis 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 600 W. Manning St., Chattanooga.

TEXAS—The Euclid Road Machinery Co., 1007 Levee St., Dallas 2.
Lively Equipment Co., Albuquerque, New Mexico.

UTAH—Fouiger Equipment Co., 1361 So. 2nd West, Salt Lake City 8.

VERMONT—Clark-Wilcox Co., Boston 34, Mass.

VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th and Killam Ave., Norfolk.
Rish Equipment Co., 1601 Chamberlayne Ave., Richmond 10; 405 Center Ave. N.W., Roanoke 7.

WASHINGTON—A. H. Cox & Co., 1787 1st Ave. So., Seattle 4; 2015 Center St., Tacoma; 313 North Mission, Wenatchee.
P. L. Crooks & Co., Portland, Oregon.
Intermountain Equipment Co., E. 811 Sprague Ave., Spokane 2.

WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh.
Rish Equipment Co., Kanawha Blvd., Charleston 22; East on U.S. 60, Clarksburg; P.O. Box 389 Bluefield.
L. B. Smith, Inc., Philadelphia, Penna.

WISCONSIN—Euclid-Chicago Co., Chicago 31, Ill.
The Euclid Road Machinery Co., Hibbing Minn.

WYOMING—Constructors Equipment Co., Denver 5.
Fouiger Equipment Co., Salt Lake City 8, Utah.

Five Contracts Speed 13-Mile Highway Job

Fills Settle During Winter Before Bituminous Road-Mix Is Laid On New Hampshire Route 9

• TO speed reconstruction on 13 miles of State Route 9, the New Hampshire State Department of Public Works and Highways divided the project into five separate contracts. The bulk of the grading was completed by the end of last year, permitting the fills to consolidate fully over the winter before the bituminous road-mix pavement was put down this season.

The scene of this concentrated activity is on the busy Keene-to-Concord Franklin Pierce Highway, named after New Hampshire's only President, whose birthplace near Hillsboro is at the eastern end of the job. The western terminus of the improvement is at Stoddard.

During the summer the traffic count on this highway is nearly 2,000 a day, and the old 20-foot built-up tar surface was in need of repair. The new road has a 24-foot pavement, and the sharp curves and steep grades are eliminated or greatly reduced. Designed for vehicular speeds of 50 mph, the highway has a maximum curvature of 6 degrees, and a maximum gradient of 6.76 per cent. Sight distances for passing are at least 1,400 feet.

The crushed-gravel bituminous road-mix pavement is 3 inches thick and is crowned 3 inches at the center. It is laid on a 12 to 24-inch-thick gravel base course that extends out to the slope lines. Shoulders are 5 feet wide and are pitched at the rate of ½ inch to the foot. In fills up to 10 feet high the sideslopes are 4 to 1; above that the slope is 2 to 1. In earth cuts the slopes are 2 to 1, while in ledge rock they are 1 to 2.

Five Contracts

Work started at the extreme eastern end of the project under a 1.33-mile contract to the Manchester Sand & Gravel Co. of Manchester, N. H., which got under way the middle of December, 1950. This stretch was entirely relocation, included a 70-foot bridge, and cost approximately $152,000. With favorable weather the contractor was able to complete his rough grading before mid-winter, and thus was permitted to pave this short section during the 1951 season. On the other contracts no paving was laid until this year.

Adjoining, to the west, is a 2.63-mile contract of the Charter Oak Construction Co. of Hartford, Conn., which had a low bid of $238,000. The contractor got under way on this section in May, 1951, and most of the excavation consisted of sand and gravel.

Over the remaining three contracts the soil was generally clay, silt, and hardpan, interspersed with ledge and boulders. For all contracts the excavation item was unclassified.

Lambert Construction Co. of White River Junction, Vt., has the next contract to the west—the longest of the group at 4.73 miles, and also the costliest to build, with the estimated bid at $512,738. This contract also started in May, 1951, and is described in more detail later.

(Continued on next page)

C. & E. M. Photo

A Thew-Lorain 1¾-yard shovel loads an Autocar with pit gravel for the New Hampshire State Route 9 improvement.

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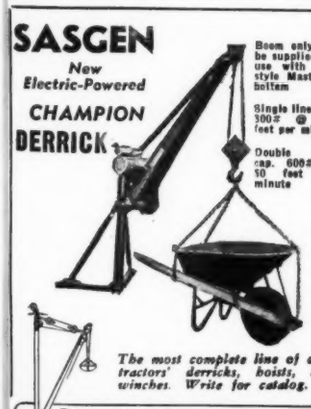

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NEW CARTRIDGE-POWERED MODEL 450

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Test-proved to be the world's finest and speediest fastening system, the Model 450 Remington Stud Driver is made by Remington Arms Company, Inc., *America's oldest and foremost sporting arms manufacturer*. Price for Model 450, complete in rugged steel carrying case—only $119.50. To obtain detailed information on this time and money-saving tool, and for the name of your nearest distributor, fill out and mail the coupon below.

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Speeds all these jobs . . . and many more!

1. Fastening wood sleepers to concrete or steel.
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4. Fastening wood furring strips to concrete walls and ceilings for attachment of metal lath.
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Five Contracts Speed 13-Mile Highway Job

(Continued from preceding page)

Manchester Sand & Gravel Co. got another section of this improvement with a 1.65-mile contract just west of the Lambert job. The successful low bid was $239,000, and work got under way in August, 1951. As this was the last piece to be put under contract, it is not scheduled for completion until this October. The others are expected to be finished by the middle of this month.

A 2-mile gap was left at the westerly end of Manchester's second contract, since this portion of State Route 9 was not as badly in need of rebuilding as the rest of the project. When additional revenue is available, it too will be placed under contract.

Next and last contract in the current work, 2.77 miles long, went to Thomas W. Watkins & Son, Inc., of Amesbury, Mass., on a low bid of $277,612. Work started early last year, and is scheduled for completion this month.

Four States Represented

The four contractors engaged on the project are from as many different states — New Hampshire, Vermont, Massachusetts, and Connecticut. Their combined bids total $1,419,350, and when the right-of-way charges are included, the total cost of the project will be over $1,500,000. This is at the rate of about $120,000 per mile.

Roadway excavation for the 13 miles totals around 375,000 cubic yards, and unit prices on the unclassified material ranged from 74 cents to $1.20, with the average approximately 90 cents. Average unit price for the 360,000 yards of borrow required was 57 cents a yard. For the gravel base course, averaging 2 feet in depth, the unit price was 82 cents for the 158,000 yards of material. Crushed gravel for the road-mix pavement came to 31,000 tons for which the average unit price was $3.93.

Tar for priming the gravel base amounted to 260,000 gallons, with the unit price at 18 cents a gallon. Another major bituminous item was the cut-back asphalt for the road-mix, which totaled 382,000 gallons for the entire project. Unit price averaged 16 cents.

Lambert Contract

The Lambert Construction Co. contract included a 65-foot-span bridge having a clear roadway of 28 feet and flanked by a 2-foot 6-inch walk on each side. Steel I-beams support a reinforced-concrete deck. The steel shortage delayed the building of this bridge until February of this year, but the rough grading was completed by the end of the 1951 season.

Rock-drilling equipment included two Joy and one Chicago Pneumatic wagon drill, together with two Ingersoll-Rand Jackhamers and one Thor jackhammer. Air was furnished by two 315-cfm compressors—a Chicago Pneumatic and an Ingersoll-Rand—and a 160-cfm Joy compressor. In the wagon drills 1¼-inch-diameter steel in 6 and 12-foot lengths was used for the maximum 12-foot lifts that were shot. For the jackhammers the drill steel was 1⅛ inches in diameter, and was used in 2, 4, 6, and 8-foot lengths with Timken bits. I-R bits were used with the wagon drills, and ranged from 2½ inches down, in diameter.

With the wagon drills, holes were spaced on an average of 4-foot centers both ways, and were charged with American 40 per cent dynamite. Usually 6 or 7 sticks were placed in a 12-foot hole, and an average of one pound of dynamite was needed to get one yard of the granite rock. About 20 per cent of the 123,000 yards of unclassified excavation in this contract was ledge.

Equipment

Lambert had a pair of Thew-Lorain 1¾-yard shovels on this job, together with a Thew-Lorain ¾-yard backdigger, and a rented Bucyrus-Erie 1½-yard shovel. For dozers he used two Caterpillar D8 tractors, an International TD-14, and a D4 Traxcavator. Hauling equipment included three Caterpillar DW10's with Athey 10-yard side-dump wagons, and a fleet of 16 trucks of which 13 were rented; trucks averaged 5 yards a load

(Concluded on next page)

C. & E. M. Photo

A DW10 and an Athey 10-yard side-dump combination deposits borrow on a fill.

C. & E. M. Photo

New Hampshire Resident Engineer Joel Hill (left) and Superintendent Almo J. Cerutti face the camera.

TEXACO SIMPLIFIED L
SPEEDS O'HARE FIELD C

Here's what the contractors say:

"The saving of time and elimination of guesswork by using the Texaco Simplified Lubrication Plan were important contributing factors in completing the contract on schedule. Using the proper lubricants has paid us big dividends."

— J. M. Corbett — M. J. Boyle Co.
Chicago, Illinois

The job was constructing some 130,000 square yards of stone base runways, 21 and 27 inches thick, at U. S. Air Force O'Hare Field Base Extension, Park Ridge (Chicago), Illinois. Since this is a very active base, the job had to be done without disrupting normal operations. Work, therefore, had to be coordinated and peak performance maintained to assure completion within the limited time allotted.

All equipment on the job was lubricated and fueled exclusively with Texaco. The Texaco Simplified Lubrication Plan — which calls for *only six* Texaco Lubricants to handle all major lubrication — greatly speeded up the maintenance of equipment, and the high quality of Texaco Lubricants assured dependable, efficient performance.

TEXACO REG. T.M.

TEXACO

Maximum cut and fill on the job was 30 and 25 feet respectively.

The 77,000 yards of borrow needed to balance the earthwork came from six pits, all within ½ mile from the job. The pits amounted to little more than small pockets of suitable material, for satisfactory sources of gravel were scarce in this area. Because of the gravel shortage, an 18-inch sand subbase was first put down as a foundation for the 12-inch gravel base course. The sand was spread in 4-inch lifts by a Caterpillar motor grader, and compacted by both equipment and traffic. On the gravel a 10-inch layer was spread first, followed by the final 2 inches of fine-grading.

In preparation for the Class C-2 road-mix, the gravel base was primed with RT-5 tar applied at the rate of 0.75 gallon to the square yard for a width of 26 feet, or one foot beyond the pavement on each side to prevent raveling. Where a repriming was required this spring, the original application of tar was 0.5 gallon, followed by the 0.25 gallon remaining just before the road-mix was laid.

The 24-foot-wide x 3-inch-thick road-mix was made up of washed crushed gravel, graded from 1¼ inches down, mixed with cutback asphalt at the rate of 2 gallons to the square yard. The bitumen was applied first at the rate of 1.0 gallon to the square yard, followed by a shot at 0.65 gallon to the square yard. Then came a seal coat of 0.25 gallon that was covered with a ½-inch layer of peastone, and followed by a 0.10-gallon fog application. Either RC-3, RC-4, or RC-5 asphalt was permitted for the cutback.

Gradation for the crushed gravel and peastone fell within these limits:

Sieve Size	Per Cent Passing	
	Crushed Gravel	Peastone
1½-inch	100	.....
1¼-inch	90–100	.....
1-inch	35–70	.....
¾-inch	0–5	.....
½-inch	.....	100
⅜-inch	.....	30–60
No. 4	.....	0–15
No. 8	.....	0–5

Quantities and Personnel

Major items in the Lambert 4.73-mile contract include the following:

Clearing and grubbing	30 acres
Unclassified excavation	123,000 cu. yds.
Earth trench excavation	5,000 cu. yds.
Ledge trench excavation	1,900 cu. yds.
Earth borrow	77,000 cu. yds.
Sand borrow	30,000 cu. yds.
Gravel	46,000 cu. yds.
Crushed gravel for pavement	11,000 tons
Asphalt cutback for pavement	140,000 gals.

Lambert Construction Co. has employed an average force of 45 on its contract under the direction of Almo J. Cerutti, Superintendent.

For the New Hampshire Department of Public Works and Highways, Joel Hill is Resident Engineer on this project, with Fred Hansen the Supervising Resident Engineer for all the work on Route 9. John O. Morton is Acting Commissioner and Chief Engineer of the Department, and Robert H. Whitaker is Construction Engineer. Gen. F. D. Merrill, Commissioner, is back in the Army.

Buy U. S. Defense Bonds!

The Berger drafting kit—an all-in-one affair for field use or traveling.

Leather Drafting Kit

A kit that combines all the necessary drafting instruments and materials in one carrying case has been introduced by Berger Scientific Supplies, Inc., 342 Madison Ave., New York 17, N. Y.

The case is supplied with any one of 8 different types of drawing sets, in addition to a protractor, architect's and engineer's scale, 8 and 10-inch triangles, French curve, draftsman's tape, pencil pointer, 2 drawing pencils, and 2 erasers. There are two large inner compartments for drawing paper, notes, blueprints, etc. The case is made of scuff-proof, waterproof, simulated leather. Its carrying handles are of the slide-in type. Over-all size is 16 x 24 inches.

Further information may be secured from the company. Or use the Request Card that is bound in at page 16. Circle No. 284.

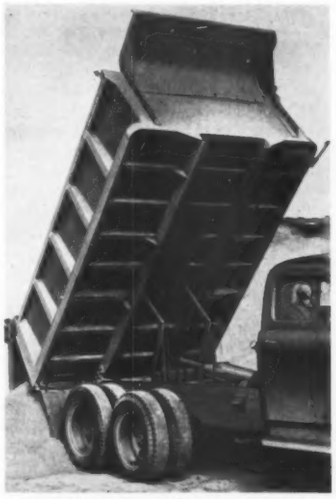
Line of Body Hoists

A complete new line of dump bodies and hydraulic hoists has been announced by the St. Paul Division of Gar Wood Industries, Inc., 2207 University Ave., S. E., Minneapolis, Minn. Fourteen models are available in a selection of capacities from 6 to 25 tons. The company claims the new line has 22 per cent more payload than previous models.

The body hoists feature low standard mounting height, advanced lifting point, low operating oil pressures, a Uniflex subframe, and pump and power take-off. A stress-eliminating design feature is said to absorb dumping shocks and permit the use of a flexible subframe which ends the tendency of rigid hoists to crack or bend when flexed.

Bodies are available in a wide range of capacities to fit a number of applications. Box-type side braces and wrap-around sides provide a rugged box. The reinforced tailgate has offset hinges for adaptability to wide spreading conditions.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 299.



Twenty-two per cent more payload—that's one feature of the new St. Paul dump bodies and hydraulic hoists.

AT WORK ON O'HARE FIELD: Texaco Lubricants and Fuels were used exclusively. Equipment included: 10 Le Tourneau Tournapulls, 6 Caterpillar Motor Patrols, 2 HD-20 Allis-Chalmers Tractors with Gar-Wood Bulldozers, 5 D-8 Caterpillar Tractors with 18-yd. scrapers, 2 HD-20 Caterpillars, 8 shovels with 2-yd. buckets, 8 road rollers, 4 air compressors, 2 trenchers, and 20 trucks.

D LUBRICATION PLAN
D CONSTRUCTION...

Products Used in Texaco Simplified Lubrication Plan

1. Engine Lubrication: Use *Texaco Ursa Oil X*** for both heavy-duty gasoline and Diesel engines. Fully detergent and dispersive, it keeps engines clean, protects against wear, rust and corrosion. Reduces maintenance costs and fuel consumption.

2. Chassis Lubrication: Use *Texaco Marfak.* It won't jar or squeeze out of bearings, gives longer lasting protection against dirt, rust, wear. *More than 400 million pounds of Texaco Marfak have been sold!*

3. Wheel Bearing Lubrication: Use *Texaco Marfak Heavy Duty.* It seals out dirt and moisture, seals itself in — assuring longer bearing life and safer braking. No seasonal change required.

4. Crawler Track Lubrication: Use *Texaco Track Roll Lubricant.* It gives long-lasting protection against dirt, water and wear. Reduces maintenance costs.

5. Air Compressor Lubrication: Use the Texaco air compressor oil recommended to exactly suit your operating conditions.

6. Rock Drill Lubrication: Use *Texaco Rock Drill Lubricant EP.* It gives superior protection against wear, prevents rust whether drills are running or idle.

Let a Texaco Lubrication Engineer show you how the Texaco Simplified Lubrication Plan can be adapted to your particular job conditions — can save you time and money on every project. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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FOR ALL CONTRACTORS' EQUIPMENT

Faithfully yours 50 for Fifty Years

Light-Work Dredge Is Small and Compact

Diesel-Driven Santee of Charleston, S. C., Has an 8-Inch Suction Pump That Can Dredge Up to 250 Yards per Hour

C. & E. M. Photo

The Santee has a 30-foot ladder suspended from a 20-foot A-frame over its bow. Astern are the two hollow steel spuds, 10 inches in diameter x 30 feet long, hung from a 24-foot-high gantry frame.

• LAST year a new dredging firm came into being when the tiny dredge Santee began churning up the waters of the Wappoo Marina, Charleston, S. C. Known as the Santee Dredging Co., Inc., the firm is made up of several South Carolinians who designed, financed, and built the diesel-driven craft for light work along the coast. It is expected to fill a need on jobs that are too small for large dredges to undertake economically, or where draglines are impractical to operate. The little dredge with the 8-inch discharge pump has demonstrated that it is capable of handling such work as building highway fills with hydraulic material, and dredging for slips, marinas, or ponds in real-estate developments.

Its first job was enlarging the inner end of the Wappoo Marina, a sheltered lagoon for small craft along Wappoo Creek, part of the Atlantic Intracoastal Waterway that empties into the Ashley River at Charleston. This is where the Santee was assembled, and the marina still serves as its home berth between assignments. It is towed to location by the 40-foot cabin cruiser Diane which is powered by two Chrysler 40-hp engines. This is the second 8-inch dredge Santee has built.

Assembling the dredge last spring, when materials and supplies were hard to obtain, was a complex and difficult problem. Its component parts came from far and near, pipe for the discharge line being procured in New Mexico, while the steel hull for the dredge was bought at Georgetown, S. C. A former landing craft, the hull is 47 feet long, with a 14-foot beam, and draws 4 feet of water. A timber deck house, painted white, is built up from the side bulkheads, and extends nearly the full length of the craft.

Uses Original Engines

What were originally the bow and stern of the landing craft have been reversed in converting the hull for use as a dredge. A transverse watertight bulkhead divides the hull into two main sections, with the dredge pump in what is now the forward compartment once occupied by the two diesels that drove the craft. These engines have been moved back to the new stern compartment where they supply the power for operating the dredge.

Both are GM Gray Marine 6-cylinder diesel engines which provide 165 hp at 1,800 rpm. By substituting a No. 90 for the No. 65 injectors, the horsepower may be increased to 225. The main engine, or the one that drives the pump, is located just aft of the transverse bulkhead along the starboard side of the hull. The other engine, which runs the main generator, is farther back toward the stern on the center line of the dredge. Just forward of this engine, and connected to it by a flexible coupling that allows a play of 12 degrees, is a Crocker-Wheeler 75-kw 1,150-rpm generator that furnishes current at 110 volts 600 amps dc to a switchboard just aft of the bulkhead on the port side. From there the current is distributed to motors on the cutterhead, swing gear, and auxiliary pumps; it also serves for lighting the dredge.

Fuel for the diesels is contained in two 1,000-gallon skin tanks, one in each of the side bulkheads reaching from the bilge to the deck line. From these tanks the fuel is pumped up to a 352-gallon tank directly aft of the generator engine. From this comparatively elevated position, once the bow of the landing craft, the diesel fuel is piped to the two engines by gravity feed. This system eliminated trouble that might possibly arise if the fuel were pumped directly from the storage tanks to the engines.

Can Dredge to 17 Feet

The 30-foot ladder, of built-up I-beam and channel construction, is suspended from an A-frame 20 feet high and made from 6-inch steel pipe. The A-frame also supports a depth gage that drops down with the framework of the ladder as it is lowered to the bottom. At present the Santee can dredge to a depth of 17 feet, but certain revisions are planned that will permit digging to a 21-foot depth.

At the front end of the ladder is a 5-blade cutterhead, 34 inches in diameter, turning at the rate of 19 rpm on a $3\frac{11}{16}$-inch shaft that is carried along the top of the ladder. The cutterhead is driven by a General Electric 30-hp motor located in the bow at the base

(Concluded on next page)

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FOR ALL MAINTENANCE AND SMALL PAVING JOBS

PORTABLE...COMPACT...LOW COST

The Mixall is the ideal patching or maintenance mixer—a natural result of Barber-Greene's years of research and engineering experience as the leader in the bituminous paving field. It offers an exclusive combination of an efficient rotary drum aggregate dryer with a proved B-G twin shaft heated pugmill mixer, and is called the Mixall because of *all* the things it can do . . .

MIX ALL QUANTITIES: from a single batch up to 5 tons per hour of hot mix—or up to 10 tons per hour of cold patch. Ample for all maintenance and small paving jobs.

MIX IN ALL LOCATIONS: towed to the job by truck loaded with aggregate . . . fed directly from truck or from stock pile or pit. Can work in a single traffic lane.

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of the A-frame, and covered with a metal drum to keep it dry. Through a reduction gear and controllable-speed switch box, the cutterhead movement can be increased to 50 rpm.

Also carried by the ladder, but on the under side, is the 10-inch intake or suction line running back from the cutterhead. It enters the hull through a rubber sleeve or stuffing-box type of connection that keeps out the water, and joins the bottom of the pump which is located in the forward compartment and on the dredge center line. A T in the line, before the pipe enters the pump, permits the removal of obstacles before they can do any damage.

Dredge Pump

Built by the Georgia Iron Works, the 10-inch suction and 8-inch discharge pump swings a 32-inch four-vane impeller. It is an overshot-design pump, with the discharge line leaving at the top and running back along the port side, outside the cabin, to the stern of the dredge. The pump and its driving engine, on opposite sides of the transverse bulkhead, are not in line, but their shafts are connected by a 14-inch V-belt drive. Through a 2:1 reduction gear on the main engine, the pump shaft is turned at an average rate of 672 rpm when the engine speed is 1,500 rpm. On the shaft directly behind the pump is an SKF bearing to absorb the thrust.

C. & E. M. Photo

The Santee's 5-blade cutterhead at the front end of the ladder turns at the rate of 19 rpm on a 3 11/16-inch shaft running along the top of the ladder.

At the port side of the pump is a G-E 20-hp motor that drives the swing gear through an American Pulley 13.5:1 reduction gear. With this unit the 925-rpm speed of the motor is converted to a minimum speed of 4 rpm up to a maximum of 33 rpm on the swing gear. Forward of the pump is the five-drum Georgia Iron Works swing gear laid out transversely across the hull. At present each drum handles 150 feet of line, but could accommodate 200 feet. The center drum that lifts the ladder carries ¾-inch line; the two adjoining drums with ½-inch lines handle the swing; while the two outer drums, also with ½-inch cables, raise and lower the spuds.

The two spuds, outside the hull at the stern, are hung from a gantry frame 24 feet above the deck, and constructed of 6-inch steel pipe. The spuds are hollow steel cylinders, 10 inches in diameter x 30 feet long, and slide in wells secured to the stern. The port spud, which is lowered to the bottom when the dredge is digging, is slightly heavier than the starboard or "walking" spud. When fully equipped for dredging, the Santee has a gross weight of 42 tons.

In Operation

Above the swing gear at the bow of the dredge is a platform for the operator; the deck house is slightly higher at the forward end to provide headroom. A G-E drum-switch control permits seven speeds forward and seven in reverse on the swing gear. Ten control levers actuate the five drums, one friction and one brake lever for each drum.

Readings on the vacuum and pressure gages in the control room vary naturally with the length of the discharge line and the load or type of material being dredged. In average operation the vacuum is somewhere around 15 inches, and the pressure between 40 and 60 psi. The Santee can pump from 150 to 250 cubic yards an hour through a discharge line up to 1,500 feet in length.

The 40-foot lengths of floating line are supported on eight oil drums welded together into pairs, two pairs on each side of a section. The opposing pairs are joined with 4 x 6 strongbacks secured by stirrups passed around the drums. The pipe lengths are connected by rubber sleeves. For the shore line the pipe comes in 16-foot lengths with standard slip-joint type connections. Some 20-foot lengths of aluminum pipe are also in use and are proving very satisfactory.

Maintenance and repair work aboard the dredge is handled by a Lincoln 200-amp welding machine driven by a Wisconsin gas engine. This unit is located on the stern deck. A workbench with an assortment of small tools is built against the transverse bulkhead in the engine room.

Personnel

The dredge was built by Captain Hardy W. Johnson, Master of the Santee, from designs drawn by him and Richard M. McGillivray, President of Santee Dredging Co., Inc. It is operated by a five-man crew including Captain Johnson and Engineer Julian Taylor, a mate, and two deck hands.

Preventive maintenance is more essential than ever. The careful selection and use of good lubricants at regular intervals will keep your equipment operating efficiently.

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During the war our roads took a terrific beating—while new construction and repair programs were cut to a minimum. Since the war, in the face of ever heavier traffic loads, rising costs and lack of funds continue to limit new construction and place an even greater burden on maintenance programs in city, town, county and state. Road maintenance is primarily patching—the "stitch in time" that prevents major breakups. Yet until the advent of the new Mixall, an efficient and economical means of producing all types of hot, high-quality patch material has not been available.

ROTARY DRUM DRYING AND HEATED TWIN SHAFT PUGMILL MIXING under independent control mean that the Mixall produces the finest hot patch material, regardless of the type needed.

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UNICIPALITIES: the Mixall makes possible immediate attention to patching and other maintenance needs regardless of quantity of mix, type of mix or location of job. The Mixall takes mixing out of the pit and puts it to the job, wherever you want it.

ONTRACTORS: a virtually untapped market promises profit to those who go after it with the Mixall—driveways, sidewalks, barn floors, railroad crossings, outdoor storage areas, service stations, parking areas, tennis courts, playgrounds, etc.

E IT IN OPERATION: Complete demonstration programs are being carried out by Barber-Greene distributors who are also presenting the sound-color movie, "Here Is The Answer." Get in touch with your BG Distributor and arrange to be present. In the meantime, fill in the coupon and send for more complete details.

A small, highly portable unit, capable of on-the-spot production of even the highest types of hot mixes comparable to those produced in Barber-Greene's largest continuous hot mix plant—*that* is the Mixall. Its range of usefulness extends throughout the field of road maintenance into small paving and resurfacing jobs. With the Mixall, municipalities, maintenance engineers and contractors need no longer resort to inferior cold patch material or be dependent upon the type of mix currently being produced by their local central plant sources.

Barber-Greene Company
Aurora, Illinois

Send me the descriptive 8-page bulletin on the Mixall.

Name .....

Firm Name .....

Address .....

City ..... State .....

New Dozer Attachment

A Blackhawk dual-action dozer attachment, used with Blackhawk half-tracks, is made by The Arps Corp., New Holstein, Wis. The ⅜-inch blade is raised and lowered through the use of a double-acting ram and two-way hydraulic control valve. It is made in 4, 5, and 6-foot lengths and is 19 inches high. It will lift 18 inches above wheel level and 3 inches below.

A push or pull on the handle operates the up and down movement. For digging and cleaning ditches, the blade may be tilted. A depth indicator projecting above the tractor tells the operator how far the blade is above or below wheel level. Side plates and skid shoes are also available.

Arps Corp.'s Blackhawk dual-action dozer is shown here in use with Blackhawk half-tracks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 353.

A Sawhorse Bracket

A new sawhorse bracket has been added to the line made by Dalton Mfg. Co., 20 S. Central Ave., St. Louis 5, Mo. The Spee-Dee features flanged nail holes which make it easy to pull out nails when taking the horse apart. They also eliminate hammering on the bracket to loosen nails.

The brackets are made of steel and have a rust-resistant finish. They take either dressed or common 2 x 4 lumber. The company points out that the legs will not slip or work loose from the Spee-Dee bracket.

Further information may be secured from the company. Or use the Request Card that is bound in at page 16. Circle No. 314.

The flanged nail holes of the Spee-Dee sawhorse bracket make it easy to pull out when taking the horse apart.

FOR A ROCK BUSTING SHOVEL

GET AIR CONTROLS and HYDRAULIC COUPLING

...IN THE LORAIN 820

HERE'S WHY! Rock busting takes guts in a shovel. It takes plenty of power—plus a design that can stand up against battering-shattering impacts. That's why you need—and should demand—these two, outstanding, important Lorain-820 features.

The finger-tip control of Lorain "Air-Assist" on crowd, retract and travel clutches makes it *easy* on the operator—yet retains the full "feel" of the machine so necessary for fast production in rock. Full air control of tread lock, steering, crowd brake, and jaw clutches lessen operator fatigue, increase yardage. And the final touch—a typically Lorain design bonus—*is that all air controls are equipped for mechanical or manual auxiliary operation.*

There's *immediate* take-over—no lost time.

Handle Rock?—why a Lorain 820 is just made for it. Air does the work—and the Lorain Hydraulic (fluid drive) Coupling takes the "shock out of rock" to give the smoothest operation—without operator fatigue—with less strain on the machine. Digging shocks and impacts "melt away"—just can't be transferred into the mechanism and cables. The engine "never-says-die" . . . it hangs on until the most unyielding rock is in the dipper.

There are many more 820 features that make it worth your while to investigate this leader of the 2-yard shovel class. To be sure of a "rock buster" (not a shovel buster), get the Lorain-820 story from your Thew-Lorain Distributor—real soon!

FREE BOOKLET...

If your work calls for a *big* rubber tire crane, get your copy of the new booklet picturing mighty 45-ton Lorain Moto-Cranes, model MC-824, in action. It's a picture book of the world's largest crane on rubber . . . on big jobs across the country. Be sure to get a copy of this unusual job booklet.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN 820

Highway Department Fights Rising Lakes

The rising water levels of Lakes Michigan and Huron and of the St Clair River are threatening to undermine and destroy Michigan trunkline highways along their shores. In an effort to counter the danger, the State Highway Department expects to spend some $1,000,000 this year, and has already spent about $300,000 erecting jetties and placing rock along the lake shores to halt erosion.

Each jetty consists of a wooden wall supported by piles, driven into the sand at the edge of the water and running parallel to the shore, with the top about 1½ feet above the water. Similar walls run out into the water at right angles to the shore for 80 to 100 feet.

The Department's first experience with this wave erosion was at Shoreham, south of St. Joseph in Berrien County. With the bottom of the embankment eaten away, the top of the bluff came tumbling down, bringing with it uprooted trees. In this area some 250 feet of valuable property on U. S. 12 have been eaten away in the last few years, forcing many people to move their homes. The Department installed the first jetties at this spot two years ago. Eleven of them are now in successful operation, but immediately south of the jetties the erosion is continuing at an alarming pace and has already cut away the lake-shore bluff until it is within a few feet of the highway. Four additional jetties near Shoreham will probably be installed.

Another victim of erosion was M-20 near the Muskegon State Park, where it cost about $35,000 to install seven jetties and 650 linear feet of seawall. Also on M-116, north of Ludington, the Department has 11 jetties and 1,100 feet of timber seawall under construction, and has recently contracted for another 1,200 feet of protection, consisting of 14 more jetties.

At various other sites where the Department is taking action, conditions do not always call for jetties. Sometimes stone riprap along the lake shore or river bank controls the waters. For instance, several miles of U. S. 2 in the general vicinity of Brevort have suffered damage from the pounding of Lake Michigan waves. For the time being at least, the Department has stopped the danger by banking huge chunks of stone against the shore, with smaller stones on top.

Highway Commissioner Charles M. Ziegler emphasizes that the expenditure incurred on these counter-erosion measures will be only a small fraction of what it would cost if sections of lake-front highways should be wiped out and the State forced to relocate them.

American Hoist Elects

John E. Carroll was recently elected a director on the Board of American Hoist & Derrick Co., St. Paul, Minn. Mr. Carroll, who has been Vice President of Sales since 1951, joined American Hoist & Derrick organization in 1937.

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THE SLOPE-M

Concrete Hauler Also Bulk-Cement Hauler

A new application for the nonagitating Dumpcrete concrete hauler is announced by Maxon Construction Co., 131 N. Ludlow St., Dayton 2, Ohio. A steel cover with loading hatch attaches to the unit and converts it into a bulk-cement hauler.

According to the company, the hauler is fast, efficient, and economical for contractors who have quantities of concrete to pour on jobs where the batching and mixing plant is located away from a railroad siding. When the need arises they can take off the cover and use the Dumpcrete for delivery and placement of concrete, as well as for hauling sand, gravel, crushed stone, and earth.

Bulk-cement capacities for each size of Dumpcrete with a steel cover are as follows: the 2C has a 4.1-cubic-yard capacity or 25 barrels; the 3C, 5.7 cubic yards or 34 barrels; and the 4C, 7.2 cubic yards or 43 barrels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 344.

FM Radio-Telephone

A 2-way FM radio-telephone system is offered by Hallicrafters Co., 4401 W. Fifth Ave., Chicago, Ill. The portable Littlefones weigh from 9½ pounds for the dry model to 14 pounds for the higher-powered storage-battery types. Two of these units, when used at ground level, provide radio-telephone communication over distances of 2 miles.

The Littlefones consist of a crystal-controlled double super-heterodyne receiver and a crystal-controlled phase-modulated FM transmitter. Models are available covering the 25 to 50-megacycle and 150-174-megacycle range.

The central-station model obtains power from a transformer-rectifier system. It operates on standard 50/60-cycle 105-125-volt ac. A complete line of accessories including carrying cases, pack harnesses, ear pieces, and chargers is also available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 352.

Four District Managers

The appointment of four new district managers is announced by Pettibone Mulliken Corp., Chicago, Ill. The managers, who are all in the Construction Equipment Division of the company, are as follows: Arnold C. Lee, for the newly created territory of Washington, Montana, a portion of Idaho, Alaska, and the Canadian provinces of British Columbia, Alberta, and Saskatchewan. Alex E. Ainlay, for the newly created territory of Colorado, Wyoming, Utah, eastern Idaho, and a portion of New Mexico. K. Ray Merrick for Michigan, Indiana, Illinois, Missouri, Kansas, and a portion of Arkansas. C. W. Stewart, formerly District Manager of the territory now covered by Mr. Merrick, is transferred to the newly created territory comprising the northern half of California, Nevada, Oregon, and a portion of Idaho.

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
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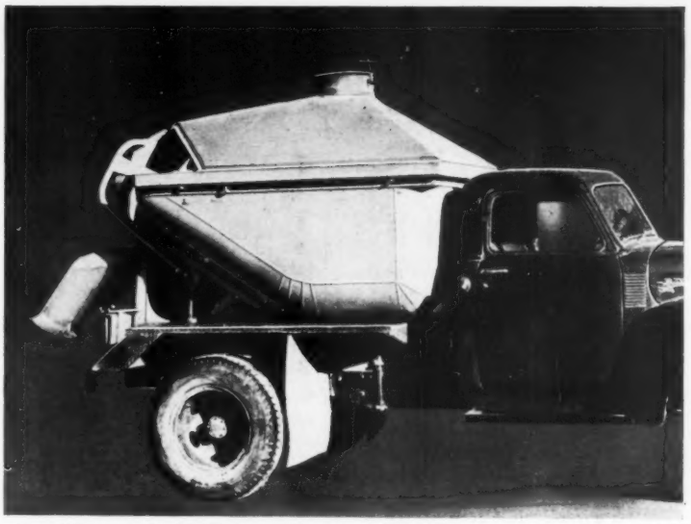
THE SLOPE-METER CO. EXCELSIOR, MINN.



Something new for the Dumpcrete hauler—a steel cover with loading hatch which converts it into a bulk-cement hauler.

Literature on Guardrail

Literature on a 3-cable highway guardrail is available from the American Steel & Wire Division of United States Steel, Rockefeller Bldg., Cleveland 13, Ohio. The Multisafty consists of steel posts, an offset spring bracket, an anchor rod, and general cable fittings. The bulletin includes a diagram showing actual vehicle tests on the rail at a number of angles and speeds.

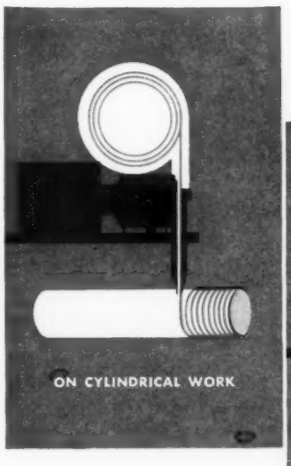
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 327.

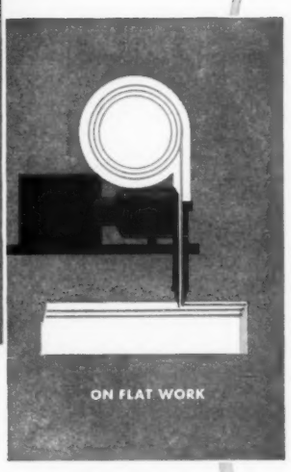
Changes Name of Works

Worthington Corp., manufacturer of pumps and construction machinery, announces that its Dunellen, N. J., works has been renamed Plainfield Works, Plainfield, N. J. All correspondence should in future be addressed to Worthington Corp., Plainfield Works, S. Second St., Plainfield, N. J.

For automatic welding...

STOODY 104





A New Tubular Fabricated Build-up Wire

Stoody 104 was specifically developed to supply properties lacking in high carbon weldments—exceptional strength, ductility, resistance to abrasion and deformation. Designed also as a final overlay for certain types of equipment such as tractor track rails, sheaves, mine car wheels, etc.

Stoody 104 bonds readily to all weldable SAE and AISI steels, forms an ideal underlay for hard-facing alloys. Deposits are readily machinable and respond to heat treatment.

Ask for fully descriptive folder from your Stoody dealer . . . listed in the telephone directory "yellow pages" . . . or write to

STOODY COMPANY
11936 E. SLAUSON AVENUE,
WHITTIER, CALIFORNIA

Spa Road Raised Above Flood Level

Improvement Includes Reinforced-Concrete Pavement 40 Feet Wide, and Long 6 x 6 Culvert to Drain Area

• LAST year the State Highway Commission of Indiana reconstructed a short but essential section of State Route 56 at French Lick, well known health and pleasure resort. The old spa, once a favorite watering place for the Indians, is in Orange County, in the south-central part of the Hoosier State. Marked by rounded hills, deep valleys, and sharp ridges, the area is subject to flash floods. During 1950, high water made this heavily traveled road impassable on seventeen different occasions. Motorists were forced to detour as much as 3 to 5 miles in order to get around the flooded portion of the valley.

Accordingly the Highway Commission awarded a contract for the rebuilding of a 0.27-mile stretch of this road to Berns Construction Co. of Indianapolis, Ind., on its low bid of $155,614.51. Principal features of the work included grading, structures, and a reinforced-concrete pavement 40 feet wide between curbs. The project got under way May 1, 1951, and was completed last October.

History of Old Road

In French Lick, situated in the limestone belt of Indiana, the drainage is to the north end of town where State Route 56 or Indiana Avenue runs northeast past the French Lick Springs Hotel on the west side of the highway, and the bottling plant for Pluto water on the east side. These private commercial interests built the original road back in 1913, with a 36-foot brick pavement laid on a sand cushion over a concrete base, and bonded with a slush mortar. A 4 x 6 culvert, of cut-sandstone blocks, was built to take care of the runoff from this 7-mile-long valley, known locally as Moonshine Gulch.

Over the years the culvert deteriorated, the blocks crumbled or broke up, and the invert of the structure became clogged with rubble and debris. Water coursing down the hills after a heavy rain was no longer quickly carried off by the culvert to Lick Creek at the north end of the resort area. It lay instead on the valley lowland, spreading out over the highway and adjoining property. The brick pavement and its foundation naturally suffered from this recurrent flooding.

In the 1,453-foot improvement of this highway, the State has raised the grade an average of 3 feet putting the roadway above the level of the greatest flood on record. A modern 6 x 6-foot concrete box culvert extends nearly the length of the job, as it runs for 1,179 feet under the sidewalk along the east side of the pavement, draining north into Lick Creek. The structure was built by J. L. Wilson, a subcontractor of Bloomfield, Ind., in 28 working days, and replaces the old stone culvert.

Since the profile of the new pavement is practically flat, five special-size inlets, 3 x 8 feet, were installed along the gutter line to drain off storm water into the paralleling culvert. Because of the roadway fill, 18 brick tree wells were built around the trunks of large and beautiful trees on hotel property close to the highway. The wells held back the dirt embankment and insured a constant supply of oxygen to the roots of the trees.

On 6-Inch Stone Base

The old pavement was torn up for the length of the project, which extends north from above Maple Street to the tracks of the Chicago, Indianapolis & Louisville (Monon) Railroad. Grading consisted entirely of fill which was obtained from a borrow pit ½ mile from the job. An Insley ¾-yard dragline loaded the material, a dense yellow clay, into trucks that hauled it to the site. There it was spread by a Caterpillar D7 tractor-dozer, and compacted by a Buffalo-Springfield 10-ton 3-wheel roller.

Of the 40-foot width of pavement between standard integral curblines, the center 22 feet is for the regular traveled way, and is flanked on each side by a 9-foot parking strip. Special subgrade treatment in the form of a crushed-stone base course 24 feet wide, was laid as a foundation for the two 11-foot traffic lanes, extending one foot beyond on each side.

For this item, crushed limestone was obtained from the William Cave Quarry, 5 miles east of French Lick. The material conformed with the gradation for No. 63 crushed stone, with 100 per

(Continued on next page)

LANSING F4-½
WHEELBARROW

The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

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"We just naturally chose Dodge!"

. . . says K. F. HOFFMAN, owner, Tri-State Excavating Company, Dubuque, Iowa

"We first tried a Dodge truck in 1946," says Mr. Hoffman, "and we were so pleased with it that when we needed a new truck in 1951 we just naturally chose Dodge!

"Dodge trucks give the kind of performance we want—there's plenty of power for our heavy jobs. They're economical trucks, too. Expenses for gas, oil and upkeep stay 'way down, year after year."

Certainly, Mr. Hoffman realizes additional profits each day through the low-cost power of Dodge "*Job-Rated*" trucks—and so can you! *Whatever* you're doing—hauling dirt, spreading asphalt, or any one of many rugged jobs—there's a Dodge truck engineered at the factory to fit the job, save you money, last longer. For example, a Dodge "*Job-Rated*" 2½-ton model has a powerful 114-h.p. engine—plus the extra maneuverability made possible by short turning diameter . . . the added dependability assured by moistureproof ignition . . . and many other outstanding advantages.

Why not *make sure* that you get the power and dependability you want on *your* job? The man to see is your helpful Dodge dealer. His "welcome mat" is always out for you, and he'll be happy to give you just the information you need about the right truck for your hauling job.

DODGE "Job-Rated" TRUCKS

cent passing the 1-inch screen and 7 per cent passing the No. 200 screen. It was put down to a compacted depth of 6 inches, shaped by a Caterpillar motor grader, and compacted by a Huber 3-wheel 10-ton roller. Concrete for the shoulders or parking strips was laid directly on the subgrade.

The 22-foot pavement for the traveled way has a 1⅜-inch center crown, and a 9-7-7-9-inch cross section. From a 9-inch edge thickness, the pavement decreases 2 inches in depth in 2 feet, leaving the center 18 feet with a 7-inch thickness. The parking strips also decrease in thickness from 9 inches on the outside to 7 inches in 2 feet, and retain the 7-inch thickness the remainder of the distance to the curbing. Along the east side of the road there is a concrete sidewalk 5 feet wide x 4 inches thick, also built under this contract.

Batch Plant

In preparation for the paving, the contractor set up a concrete batch plant a few hundred feet from the north end of the job on a siding of the Monon Railroad. Aggregates for the mix came by truck—the sand from the Seymour Sand & Gravel Co. of Seymour, Ind., and the crushed stone from Radcliff & Berry Co. of Orleans, Ind. Two sizes of coarse aggregate were used. Type 1-A air-entraining bulk cement was shipped by rail from the Lehigh Portland Cement Co. at Mitchell, Ind.

Sand was stored in a Johnson 100-ton bin, and the stone was stored in a similar bin divided into two compartments. Cement was kept in a Blaw-Knox 150-barrel cement bin, equipped with an under-the-track worm-gear conveyor and an enclosed elevator at the side of the tower. A Koehring 304 crane with a 45-foot boom and an Owen 1-yard clamshell bucket charged the aggregate bins. A fleet of five trucks holding two batches each, with separate metal containers for the cement, hauled the dry materials to the paver. In loading, they drove under the stone, sand, and cement bins in that order in a wide swing back to the job.

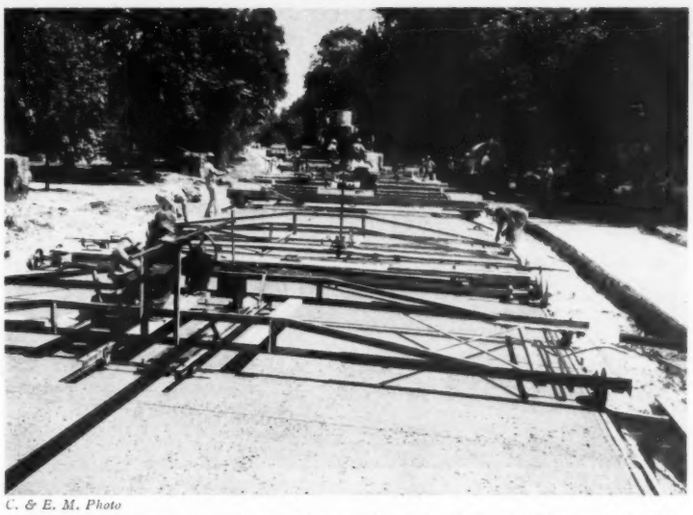
Dry weights of a typical 6.6-bag batch, with the 10 per cent allowable overload for a 27-E paver, were:

Cement	620 lbs.
Sand	1,333 lbs.
Stone, 2-U	911 lbs.
Stone, 5-L	1,360 lbs.
Water	228 lbs.
Total	4,452 lbs.

Gradation of the sand and the two sizes of crushed stone were as follows:

Sieve Size	Per Cent Retained		
	2-U Stone	5-L Stone	Sand
2½-inch	0	....	....
2-inch	0–5	....	....
1½-inch	....	0	....
1-inch	80–100	2–15	....
¾-inch	95–100	15–40	....
½-inch	98–100	40–70	....
⅜-inch	....	....	0
No. 4	....	90–100	0–5
No. 8	....	95–100	5–20
No. 30	....	....	50–80
No. 50	....	....	80–95
No. 100	....	....	95–100

The Indiana Gas & Water Co. furnished city water for the mix. The supply was tapped by a 2-inch pipeline that delivered the water to the south end of the job. From that point the water was transferred to a pair of 1,000-gallon tank trucks, with Gorman-Rupp 2-inch pumps mounted at the rear for pumping the water to the paver.



C. & E. M. Photo

Finishing equipment at work on Indiana State Route 56. In the foreground is the center-line striper; up ahead, the Koehring 27-E paver.

Pave 22-Foot Full Width First

Paving started at the south end, with the contractor doing the full 22-foot width of travel way first to the north end, then dropping back to pave the 9-foot parking strips on each side. Three thousand linear feet of Heltzel steel road forms were brought to the job, enough to lay out the entire center strip before any concrete was placed. Final grading was done by a Cleveland Trailgrader, riding on the forms and pulled by the D7 tractor. This was followed by a Fordson 3-wheel 3-ton roller to impart a final compaction before the grade was wet down and the sides of the forms were oiled.

(Continued on next page)

ROAD BUILDERS — IT'S SENSATIONAL!
DRAGS **PECKERWOOD** DRAGS
STEEL SPRING WIRE ROAD BROOMS
MADE IN ANY C-O-N-T-I-N-U-O-U-S LENGTH UP TO 12 FEET
WIDTH 6 INCHES—IT'S DIFFERENT
ASSEMBLE YOUR OWN—IN ANY SHAPE REQUIRED—IN MINUTES, NOT HOURS
NO FRAME REQUIRED
MADE WITH KILN DRIED 6" WIDE HARDWOOD AND HEAVY SPRING STEEL WIRES TRIPLE OUT EACH HOLE. NOT STAPLE SET
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RUNNING FOOT F.O.B. K.C., MO.
NOTICE! Our 15" length Unit Drag 3" wide with the two bolts that fits your frame, still $2.50 ea.
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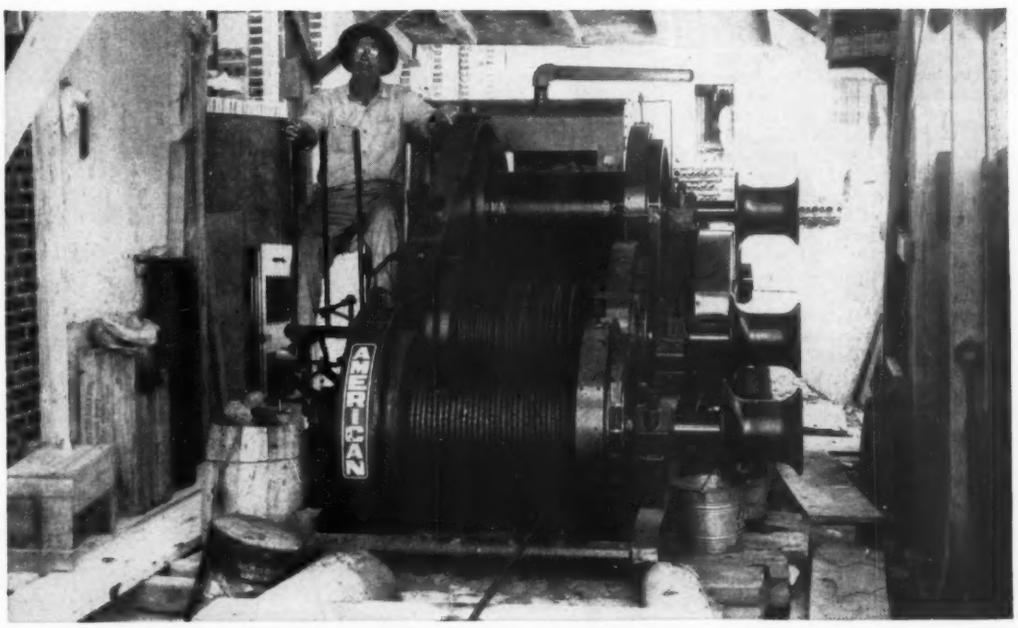
327 SO. WEST BLVD., KANSAS CITY 8, MO.

Outselling all others



THIS year, as for many years past, contractors are buying more American construction hoists than those of any other make. We make this statement not as a matter of pride for us (although it is) but as a clue to smart purchasing for you.

The picture above shows a 3-drum Model 75 American General Purpose Hoist, owned by R. P. Farnsworth & Co. Inc., New Orleans, at work on a new dormitory at Tulane University. It is one more proof of the fact that experienced, successful builders—who know their costs down to the penny—have a distinct preference for American hoists.

A full list of the "reasons why" would show dozens of design features, engineering features, assembly features quite different from those of other hoists. But the simple facts are that American hoists work better on the job, stay on the job longer, and—most important of all—*make more money for their owners*. That's why they outsell all others.

Is this the kind of equipment you want? If so, choose your next hoist from the world's broadest line, through your American distributor.

Modernize...economize...with

American Hoist & Derrick Company

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St. Paul 1, Minnesota

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AMERICAN GENERAL PURPOSE HOISTS

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

Spa Road Raised Above Flood Level

(Continued from preceding page)

Paving was done by a Koehring 27-E paver equipped with a 30-foot boom. At the lower end of the contract, where the new pavement warps in to meet the old city street, there is insufficient space for the 9-foot parking strips, so the paver worked between the forms at first. A scratch template was pulled along at the rear of the paver to make certain that the full depth of slab was being obtained. Ahead of the paver a gap was left in the forms for the batch trucks to enter and leave with their loads.

When the highway shortly flared out to full width with the 9-foot parking strips on each side, the paver moved to a position outside the forms along the east edge of the center strip. Later, in laying the 9-foot side strips, the paver worked between the form on one side and the slab already poured on the other. The 9-foot width was just enough to accommodate the paver skip. This permitted the contractor to continue paving without interruption for the three successive lanes. There would have been a delay if he had had to wait for the center strip to attain full strength, and then put his paver up on the concrete slab. In this way all paving was completed in a little over a week.

Finishing Equipment

Batches were mixed 1½ minutes, and then deposited between the forms in front of a Blaw-Knox paddle-type spreader that leveled off the concrete 2 inches below the top of the forms at the first pass. Steel-mesh reinforcing was laid on top of this first lift, and more concrete was added to bring the slab up to the total thickness. Reinforcing material, dowels, and joint assemblies were furnished by Laclede Steel Co. of St. Louis, Mo. The contractor fastened a row of truck-tire casing across the front of the spreader to serve as a bumper against contact with the paver bucket should the operator overshoot his mark.

Only one expansion joint was installed in the pavement—where the job dead-ends against the railroad tracks. Transverse contraction joints were placed on 40-foot centers, and these assemblies support ¾ x 24-inch round dowels on 12-inch centers. Longitudinal dowels were embedded in the concrete after the spreader made its initial strike-off. They are ⅝ inch x 48 inches, and are on 5-foot centers. There are no dowels along the sides of this center strip, but a 2-inch keyway was inserted next to the form to provide a bond with the parking lanes. These 9-foot lanes are reinforced with wire mesh.

Behind the spreader came a Blaw-Knox two-screed finishing machine, which was followed by a Heltzel Cleft-Plane machine that inserted a bituminous ribbon ⅛ inch wide x 3 inches deep, into the concrete along the longitudinal center line. From this unit the transverse contraction joints were cut out, and steel strips, ¼ inch wide x 2 inches deep, were inserted in the slots. No vibrators were used in laying the concrete.

Hand Work

Next in line was a Koehring Longitudinal Finisher, after which finishers checked the surface of the concrete with long-handle straightedges. Then, working from a bridge, they removed the steel strips from the transverse contraction joints as the concrete set up slightly. At the rear of this bridge was a 12-inch-wide composition belt that was pulled over the surface to remove any check marks or surface irregularities. Hand brooms with fiber bristles were pulled transversely across the concrete to score the surface lightly.

C. & E. M. Photo

A Koehring 304 crane with a 45-foot boom and an Owen 1-yard clamshell bucket charges a Johnson sand bin at Berns Construction Co.'s batch plant. That's a Blaw-Knox cement bin on the right.

Joints were then carefully edged from another work bridge with a ¼-inch-radius tool.

Indiana adds a 6-inch-wide black traffic-lane stripe down the center of her pavements. It was done on this job with iron oxide applied from a Heltzel Flexible Joint bridge. From the final bridge in the line, a strip of paper was unrolled to cover the black stripe, before the burlap was laid on for the curing process. The paper prevented any smearing of the center stripe.

Burlap was stretched across the pavement from this last bridge, and then wet down with a hose. The next morning it was removed, and the concrete covered with straw which was also kept wet throughout the curing period. This took from seven to fourteen days, according to the weather. The transverse contraction joints were then filled with asphalt.

Quantities and Personnel

Major items in the 0.27-mile high-

(Concluded on next page)

For the War Against Wear in the Fight for Economy

AMSCO

Manganese and Hardfacing Rods

AMSCOATING
THE RIGHT WAY TO SAY HARDFACING

Immediate Delivery

Impact and abrasion are always at work but their effects can be postponed through the use of AMSCO Welding Products. Reclamation and rebuilding of worn or damaged equipment parts by Amscoating means dollar-saving, long-lasting protection. The AMSCO Hardfacing System successfully fights wear caused by impact, abrasion, heat or corrosion. It assures longer equipment life and fewer repairs.

AMSCO AW-79 will meet every requirement for better control of wear where abrasion and impact are important factors—plus all the advantages of automatic welding. Especially suitable for rebuilding and hardfacing tractor rollers, steel wheels, sheeting rolls, dredge pins as well as dozens of other applications. ½" and ¾" in 22½" ID., 100 lb. coils.

AMSCO No. 459 for severe abrasion, mild impact. Has excellent abrasion resistance. All diameters, bare and coated.

AMSCO No. 217 for abrasive service up to 1100° F. The deposit retains hardness at high temperatures. All diameters, bare and coated.

AMSCO No. 6 for combination of corrosion or abrasion, or for 1000° service and above. Used as facings for tool and die applications. No. 1 has greater abrasion resist-

For prompt delivery of these welding products, contact your AMSCO distributor.

This Wall Chart can save you money. Listing over 50 common hardfacing applications, it recommends the right AMSCO rod to use and the preferred method of application. Write for this free wall chart guide today.

AMERICAN Brake Shoe COMPANY

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis.

way reconstruction contract at French Lick included the following:

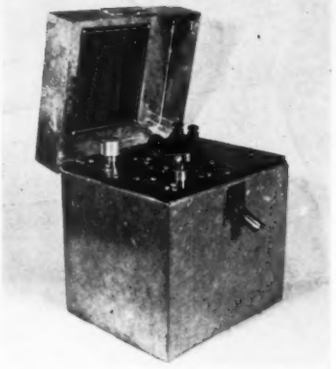
Excavation, special borrow	5,479 cu. yds.
Special borrow, grade B	1,248 cu. yds.
Concrete for structures	847 cu. yds.
Reinforcing steel (structure)	118 tons
Reinforced-concrete pavement	7,027 sq. yds.
Subgrade treatment, type II	2,145 cu. yds.
Concrete curb	3,070 lin. ft.

Berns Construction Co. employed an average force of 30 on the project under the direction of W. J. Berns, and H. E. Berns, Jr.

For the State Highway Commission of Indiana, Clark B. Colbert was Project Engineer. The project is in the Vincennes District of which Hugh Houghton is District Engineer. The Commission is headed by Samuel C. Hadden, Chairman, with Ray H. Bower, Chief Engineer, and F. L. Ashbaucher, Engineer of Road Construction.

New Blasting Machine

A portable condenser-discharge type of blasting machine is offered by E. I. du Pont de Nemours & Co., Wilmington 98, Del. The CD-45 and the CD-30 fire 200 and 125 caps respectively, for secondary blasting. The company advises against firing more than 50 caps in straight series in a primary blast.



Du Pont's CD-45 blasting machine fires 200 caps in straight series for secondary blasting.

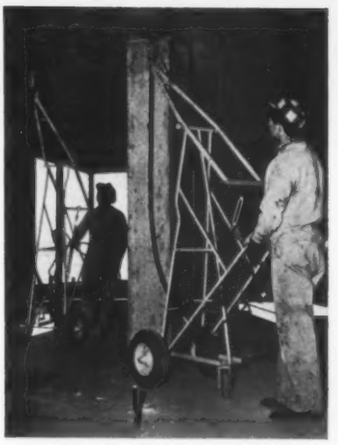
Radio-type B batteries charge a number of condensers. At the moment of firing, the condensers deliver power to the blasting circuit. The terminals are dead at all times except at the instant of firing, and they cannot be made alive unless the operator has both hands on the controls.

The CD-30 weighs 24½ pounds and the CD-45 weighs 31 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 340.

Mobile Rig Grinds Concrete Ceilings

A mobile rig for grinding concrete ceilings is made by Concrete Grinding Corp., 300 Straight St., Paterson, N. J. The Giraffe consists of an adjustable steel frame mounted on 3 rubber wheels. A ¾-hp Mall ac or dc electric motor transmits power through a 7-foot flexible shaft to the grinding head. Various grinding stones can be turned at 3,450 rpm to remove fins, ribs, and board marks on the concrete.



The Giraffe mobile rig adjusts to heights from 7 to 9 feet for grinding concrete ceilings.

The unit is adjustable for heights from 7 to 9 feet. A turnbuckle controls pressure. Only 28 inches wide, it will pass through doorways in existing buildings for modernization or restoration work. The total weight is 148 pounds. The company points out that the new rig eliminates the need for goggles, masks, scaffolds, and hard-rubbing stones.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 257.

New Safety Goggle

A safety goggle that features a transparent plastic frame to give a large field of vision is announced by American Optical Co., Southbridge, Mass. It is worn directly over the eyes or over spectacles and is designed for frontal protection against foreign particles on machine and hand tool work, chemical and physical laboratory work, spot welding, and on light grinding, chipping, and riveting.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 336.

Fork-Lift Trucks

Two new additions to the FT line of fork-lift trucks are being manufactured by The Buda Co., Harvey, Ill. The gasoline-powered FT30-15 and the diesel-powered FTD30-15 have a rated 3,000-pound capacity at a 15-inch load center. Both are powered by 49-hp engines.

Mechanical features include removable wet-sleeve-type cylinder liners for low maintenance cost, a quick-change 11-inch industrial-type clutch, a single-lever gear shift mounted on the steering column for operator convenience, and center-point steering. Both models are available in five standard masts with a 72, 84, 108, 114, and 120-inch lift.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 273.

Buda now makes a gasoline and a diesel-powered fork-lift truck of 3,000-pound capacity at 15-inch load center.

WELDING PRODUCTS

Manganese Steel Bars and Shapes

CONTROLS IMPACT and ABRASION

Through many years' experience in the production and application of manganese steel—"the toughest steel known"—AMSCO has developed welding products designed solely to conserve and protect parts exposed to impact and wear. American Brake Shoe Company's scientists and engineers are working continuously to build better defenses against wear in machines and equipment.

AMSCO Welding Rods are known for their excellent service in many applications—from rock crushers to materials handling pumps . . . in forging, rolling, stamping, and cutting . . . for gears, sprocket wheels and clutch cams . . . in grinding, mixing, and chipping operations . . . Whatever your problem of wear, there's a "proved-in-service" AMSCO Hardfacing Product that can solve it.

ance; No. 6 is the tougher, and can be machined. All diameters, bare and coated.

AMSCO No. 1 for combination of corrosion or abrasion, or for 1000° service and above. Used as facings for tool and die applications. No. 1 has greater abrasion resistance; No. 6 is the tougher, and can be machined. All diameters, bare and coated.

AMSCO FARMFACE or AMSCO CHROMEFACE for industrial and farm use. Deposit has excellent resistance to low stress sliding abrasion. All diameters, bare and coated.

AMSCO AIR-HARDENING for abrasion and severe impact. Deposit can be forged to a sharp edge without losing hardness. All diameters, bare and coated.

AMSCO HF-40 for severe abrasion and moderate impact. Deposits of HF-40 are hard and abrasion resistant. All diameters, coated only.

AMSCO HF-60 for moderate impact and severe abrasion. This rod is particularly suitable for application in both flat and vertical positions. All diameters, coated only.

AMSCO CO-MANG for build-up on manganese steel castings exposed to severe impact. Deposit has excellent impact resistance. All diameters, coated only.

AMSCO TOOLFACE for metal to metal wear up to 1000° F. Toolface deposits have excellent abrasion resistance. All diameters, bare and coated.

AMSCO DIEWELD for tools and dies. Deposit may be softened for machining and rehardened. Retains a keen cutting edge.

AMSCO V-MANG for build-up on manganese castings exposed to impact.

TUNGSTEN CARBIDE.

A complete line of manganese steel dipper tooth repointer bars and other shapes are available.

AMERICAN MANGANESE STEEL DIVISION

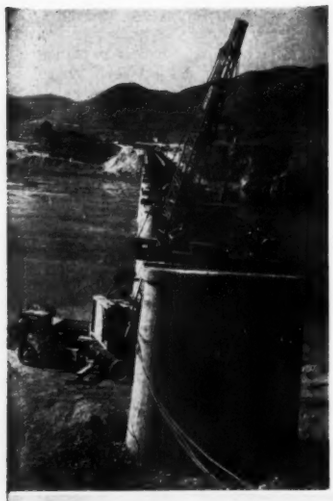
395 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

With the help of wooden skids on conveyor rollers, 23-foot-long I-beams were bolted together in pairs and the pairs strung out to form two 853-foot-long continuous girders. At right, another 23-foot section is bolted into place with 262 bolts.

Continuous Box Girders For Bridge in Korea Are Launched From Rollers

By CAPT. R. F. KAROLEVITZ



• A MULTIPLE-ROLLER system has been used by the Corps of Engineers "somewhere in Korea" to launch two of the longest continuous steel box girders in the world. The girders are 853 feet long and span the twisting, treacherous Han River, adding a link in the vital chain of supply roads for the Eighth Army.

When the bridge mission was ordered, engineers faced the problem of spanning the river with steel over 40-foot piers and abutments built by the Japanese before World War II. These elements of the unfinished concrete arch bridge had been damaged by artillery fire earlier in the campaign but were found usable when repaired.

The engineers wished to avoid the necessity of moving large crawler cranes over tortuous mountain passes to the site; they also wanted to forego working in the dangerous river bottom, so close to the enemy and subject to flash-floods which are not uncommon there. Consequently they decided to use a ground-level roller-aided launching of continuous beams long enough to span the entire river.

A concrete launching or working platform was built on one side of the river. Rollers of commercial-type conveyors, such as those used for loading and unloading packaged goods, were placed in parallel lines on the platform. Timber skids were designed to operate on the conveyors.

Two standard 36-inch built-up steel I-beams, each 23 feet long, were placed on the skids, then bolted and welded together with steel angle bracing to form box girders. When the bracing was completed, the successive pairs of I-beams were bolted together with 262 bolts for each I-beam connection. (A total of 19,388 bolts, ⅞-inch size, was used for each of the two 853-foot spans.)

Because of the conveyors, the girders were fabricated rapidly by a minimum of personnel and with a minimum of equipment. As sections of the spans were completed, they were pulled across the 40-foot piers by a Hyster winch mounted on a Caterpillar D7 tractor on the opposite side of the river. Special steel rollers built onto each pier eased the pull of the 375-ton load.

Once the girders were across, the rollers were removed and the girders jacked down onto the bridge caps. They were then cut into five separate sections by acetylene torch to allow for expansion. A laminated-timber decking completed the modern two-way highway bridge.

The girder job was accomplished by a platoon of the 439th Engineer Construction Battalion under 1st Lt. Orville

(Concluded on next page)

Special steel rollers placed on the old Japanese-built piers eased the load as the long girders were pulled across the river by a D7-mounted Hyster winch on the opposite side. In the photo at right, below, the first of the 853-foot girders is in place.

S. Beard, Houston, Texas. Lt. Col. M. Claire Miller, McPherson, Kans., commanding officer of the 439th Engineers, and Col. F. S. Tandy, San Francisco, CO of the 32nd Engineer Construction Group under which the battalion operates, planned and directed the continuous-girder project.

Colonel Tandy, who has been in Korea since early in the war and had similar bridging problems in France during World War II, said, "This unprecedented launching of a prefabricated bolt-connected steel girder 853 feet long is not likely to be duplicated soon, since in normal civil-engineering procedure girders are generally designed specifically for each particular bridge or span. I consider this unusual feat of military engineering an additional tribute to our hard-working, courageous, and skilled engineer soldiers and officers."

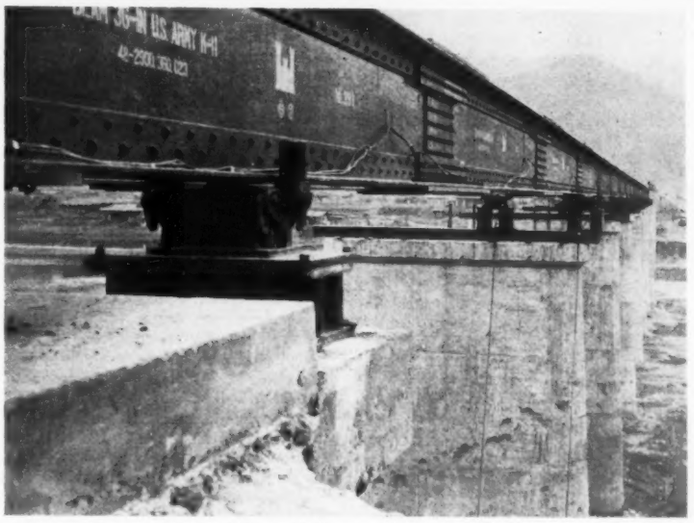
Turner Completes 50 Years

The Turner Construction Co., New York, N. Y., celebrates its fiftieth anniversary this year, and in honor of the occasion is holding dinners in all the cities where it has offices. Besides New York, these include Philadelphia, Boston, and Chicago.

H. C. Turner, Jr., the company's President, speaking at the New York dinner, mentioned that in 1902 when the company was founded its volume of business totaled $40,000. Against this, last year's record was $100,221,210. This is the greatest volume of work on its books so far, necessitating the largest staff in the firm's history.

Looking back to the early days, Mr. Turner recalled that the company's first contract, in 1902, was for a small reinforced-concrete vault for a savings bank in Brooklyn. Other early contracts included the construction of all the stairways of the first New York City subway; a 9-story building—the largest reinforced-concrete building in the country up to that time—for Robert Gair Co., Brooklyn; and the Bush Terminal Co.'s first factory building, which was to be followed by a long list of similar buildings for that company.

Turner Construction, while specializing at first in reinforced-concrete structures, later expanded the scope and character of its work to include buildings in all categories. It has erected many of the outstanding buildings in the United States.



Here's a closeup of the special steel rollers constructed on the pier caps to facilitate launching of the long and heavy girders.

New Thor Sales Division

A new Thor industrial sales division is a recent innovation by Independent Pneumatic Tool Co., Aurora, Ill., manufacturer of Thor portable power tools. Appointments for the new division are as follows: J. A. Hill, Manager of Industrial Sales; J. F. Corkery, Manager of Electric Tool Sales; and G. A. Thoma, Sales Promotion Manager.

Mr. Hill was, until his new appointment, Manager of Electric Tool Sales. He has been with the company 26 years, has more than 20 years' field experience, and has been Manager of three Thor branches. Mr. Corkery, who succeeds Mr. Hill, has been Sales Promotion Manager for the past seven years. He joined the firm in 1942. Mr. Thoma, who takes Mr. Corkery's place as Sales Promotion Manager, has six years' experience in the planning and production of the company's sales promotion and advertising. He has served as Editor of the company's newspaper "Thor Scoreboard".

Maximum Joint Filling

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Servicised

SELF-EXPANDING

CORK

▶ Recovers 50% Beyond Original Thickness After Compression
▶ Fully Compressible
▶ Non-extruding, Resilient

Ideal for large concrete structures or masses where substantial initial contraction is anticipated before any considerable amount of expansion takes place. 50% expansion beyond original thickness after compression keeps joint space filled, regardless of concrete movement. Made in ½" to 1" thicknesses; 2" to 12" (Standard) widths; also made in 24" and 36" widths on special order.

Write for Catalog and Complete details on Servicised Joint Fillers and Sealers.

SERVICISED PRODUCTS CORP.
6051 W. 65TH ST. • CHICAGO 38, ILL.

Why every type of stabilized base is stronger when mixed with the SEAMAN

The SEAMAN Self-Propelled PULVI-MIXER. 7 ft. mixing width. Gas or diesel powered.

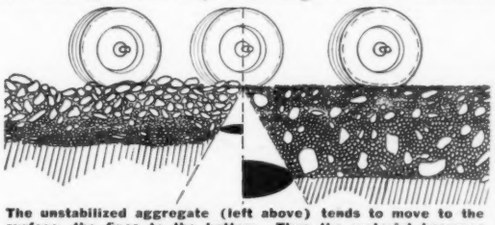
There's a very good reason why SEAMAN-mixed bases carry heavier traffic loads — and carry them longer with less maintenance. For example, take any stabilization which employs gravel. Trucking gravel to the job and especially the subsequent blading causes "segregation," — in other words, the fines sift through to the bottom — which creates an inherently unstable condition.

The SEAMAN PULVI-MIXER completely corrects segregation by *blending* and proportioning the coarse and fines equally throughout the full depth of the treatment — and at the same time thoroughly mixes-in whatever type of binder is employed. All voids are filled with the fines so that after compaction the finished stabilization is uniform and of exceptionally high density.

And if the material has previously been shaped to grade and finished crowned the SEAMAN leaves the mix ready for immediate compaction.

This basic mixing action of the SEAMAN builds a stronger, denser, more weather resistant base with every material — from soil or sand to pit-run gravel.

Put a SEAMAN to work on your job — now. And for ever after, you'll do *all* your mixing with the SEAMAN.



The unstabilized aggregate (left above) tends to move to the surface, the fines to the bottom. Thus the material becomes loose and rough under traffic regardless of binders that may be employed unless mixed-in with the SEAMAN.

The SEAMAN stabilized aggregates (right above) form a firmly knit base essential for high load-bearing characteristics. Naturally, binders mixed-in with the SEAMAN further improve the quality.

(Below) In SEAMAN-stabilized aggregate base all stones are securely locked and anchored — a basic requirement regardless of binder.

(Above) Sand-clay stabilization is stronger, more economical with the SEAMAN MIXER.

SEAMAN MOTORS, INC.

282 N. 25th ST. MILWAUKEE 3, WISCONSIN

Blaw-Knox Appointments

W. C. Snyder, Jr., President and chief executive officer of the Blaw-Knox Co., Pittsburgh, Pa., has been elected to the additional post of Chairman of the Board of Directors.

There have been two recent appointments in the company's Blaw-Knox Division, Pittsburgh. James H. Elkus is Assistant Manager, and W. J Kalmeyer is Works Manager, of that division. Mr. Elkus has been with the company since 1933, and in 1943 was made Manager of Methods and Procedures. Mr. Kalmeyer joined Blaw-Knox in 1930, becoming Assistant Plant Manager in 1950 and Manager in 1951.

Light Truck Engine

A new high-compression truck engine for 2½ and 3-ton trucks is announced by GMC Truck & Coach Division, General Motors Corp., 660 South Boulevard, E., Pontiac 11, Mich. The 302-cubic-inch engine has a compression ratio of 7.2 to 1 and generates 145 gross brake horsepower at 3,600 rpm. Weighing 545 pounds, the GMC 302 is said to be 500 pounds lighter than other engines of comparable power.

The 6-cylinder engine has a 4-inch bore and 4-inch stroke. The large bore diameter allows larger intake and exhaust valves for an engine of this displacement. And the short-stroke design gives low piston speed which, coupled with trans-slot aluminum-alloy pistons and low-friction chrome-plated top piston rings, is said to increase mechanical efficiency. The crankshaft is heat-treated, stress-relieved, and Tocco-hardened for long bearing life and maximum durability.

The short throw of the crankpins which results from the relatively short stroke makes possible an overlap between main bearing journals and connecting-rod throws, contributing materially to torsional rigidity. The torsional-vibration damper also aids by absorbing vibration impulses.

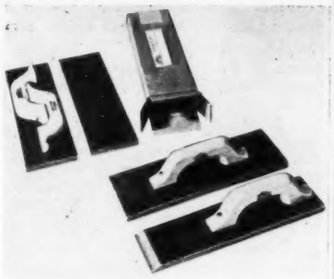
M-400 Moraine bearings, estimated to have six to ten times the life of conventional babbitt bearings and four to six times more load-carrying capacity, are used at the crankshaft main journals and at the lower ends of the connecting rod. The bearings are designed for durability and resistance to fatigue, corrosion, and scoring.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 281.

A Finisher's Float

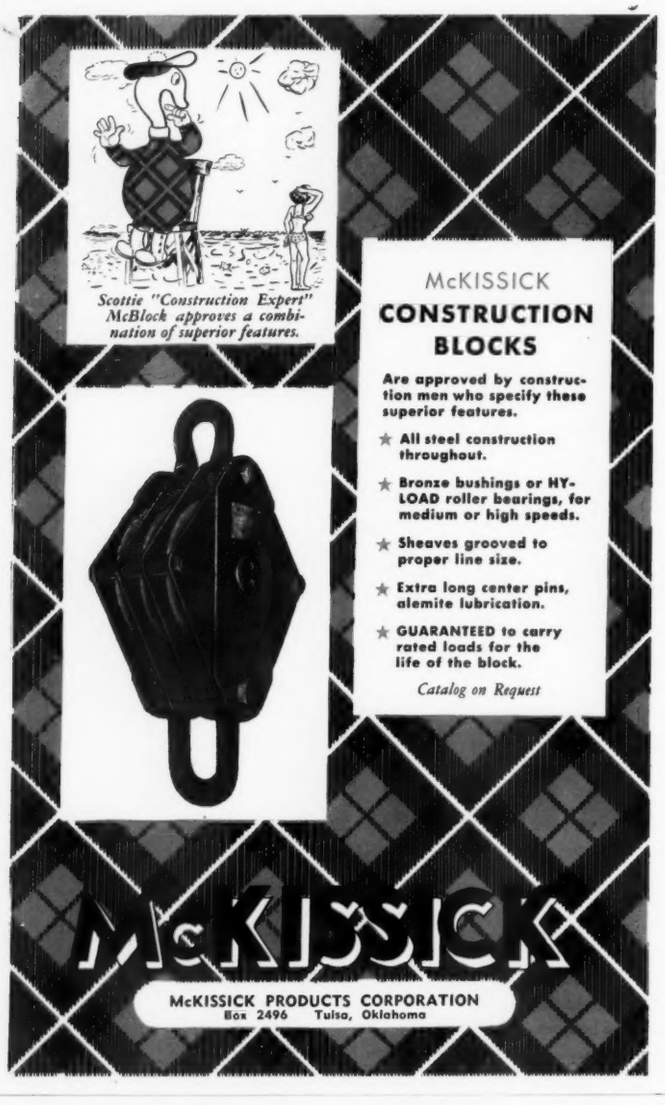
A cement finisher's float is marketed through hardware retailers by Harris, Inc., 200 E. Long St., Columbus 15, Ohio. It is made of Presdwood and is fastened to a wooden handle. No preliminary roughening of the working surface is required because the screen surface of the Presdwood comes in contact with the wet concrete.

The units are made in sizes of 4½ x 12, 4½ x 15, 3½ x 12, 3½ x 15, and 3½ x 18 inches. Each tempered-board float is ½ inch thick. The 3½-inch width is made with the extreme end slightly beveled for picking up wet concrete to fill holes or clear off form edges. The handle on the narrower model is offset for reaching a greater distance to remove humps.



This cement finisher's float is made of Presdwood and is ½ inch thick. It comes in several widths and lengths.

Further information on this finisher's float may be secured from the company. Or use the Request Card at page 16. Circle No. 347.


Scottie "Construction Expert" McBlock approves a combination of superior features.
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CONSTRUCTION BLOCKS
Are approved by construction men who specify these superior features.
★ All steel construction throughout.
★ Bronze bushings or HY-LOAD roller bearings, for medium or high speeds.
★ Sheaves grooved to proper line size.
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★ GUARANTEED to carry rated loads for the life of the block.
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WATSON-STILLMAN
HYDRAULIC POWER TOOLS FOR INDUSTRY
HYDRAULIC JACKS
WIRE ROPE SHEARS
These sturdy units, with either independent or integral pumps, are useful for many jobs in construction and maintenance. Capacities from 20 to 500 tons.
W-S wire, cable and bar shears provide years of trouble-free general service. They are light and portable for convenient on-the-job use.
PORTABLE PIPE BENDERS
HAND PUMPS
Bends all standard, extra heavy and double extra heavy steel pipe from ⅜ in. to 2 in. inclusive, as well as standard weight pipe up to 3 in. diameter. Also handles solid mild steel bars up to 2 in. diameter.
Single and double plunger types, with reservoirs of different capacities to suit the job, these hand pumps have a wide application for operating small hydraulic tools, jacks and other hydraulic equipment, and for general hydrostatic testing purposes.
Send for your copy of Bulletin A-5 It's Free.
WATSON-STILLMAN HYDRAULIC POWER TOOLS
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WATSON-STILLMAN
ROSELLE, NEW JERSEY

Speed REPAIRS! Cut COSTS!
Floor cutting in industry for machine installation.
Cutting contraction joints on new airport construction.

SAWING CONCRETE SAVES TIME, LABOR MAKES REPAIRS PERMANENT . . . TRI-LINE OPERATION IS ECONOMICAL . . . FAST . . . EASY

Highway officials and contractors everywhere are recognizing the importance of concrete sawing for faster, low-cost maintenance . . . for *contraction joints* on new pavement construction. Sawing with a Tri-Line first saves on labor cost . . . second, produces tight joints that will not spall, eliminating all after-maintenance headaches. Before you buy any saw, ask for a free Tri-Line demonstration on the job. You'll see why Tri-Line has been proclaimed "Best by Test."

Only Tri-Line Gives All These Advantages!

1. Exclusive three-wheel undercarriage prevents tilting, eliminates blade bind and excessive wear.
2. Direct-acting hydraulic control permits quick, effortless depth-of-cut adjustments.
3. Maximum maneuverability afforded by tricycle design. Turns within its own length without jockeying.
4. Sturdy construction means less vibration, less blade wear. A full 700 pounds of ruggedness.
5. Thirty-gallon tank provides water when supply is inconvenient. Can be attached to hydrant if desired.
6. Vital engine parts protected from blade spray. No shut-downs due to engine "drowning."
7. Abundant power from the 13 h.p., two-cylinder Wisconsin air-cooled engine for full-depth, full-speed cutting.
8. Double-ended arbor permits cutting on either side of the machine . . . in places normally inaccessible.
9. Tri-Line blades are double-bonded, scientifically designed for fast, clean-cutting operation.

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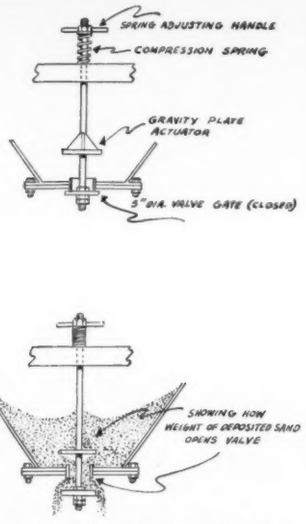
SPRING ADJUSTING HANDLE
COMPRESSION SPRING
GRAVITY PLATE ACTUATOR
3" DIA. VALVE GATE (CLOSED)
SHOWING HOW WEIGHT OF DEPOSITED SAND OPENS VALVE

Here's how the automatic valve works on Eagle's improved water scalping tank. It opens when enough sand has settled in the tank.

Water Scalping Tank Has Automatic Valve

Improvements on its line of water scalping tanks have been announced by Eagle Iron Works, Box 934, Des Moines, Iowa. To eliminate the need for continued manual operation of bleeder gates, an automatic valve has been developed which opens when sufficient sand has settled in the tank. The weight of sand on the actuator plate counterbalances the force of the adjustable spring and opens the valve. The height of the plate is adjustable.

Another recent development is the rotating spout on each discharge opening. This is used with a divided collecting-blending flume to divert part of the product to a coarse-sand washer and part to a fine-sand washer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 258.

Protective Coatings

Three new types of Neoprene liquid coating for various maintenance uses have been introduced by Mercer Rubber Corp., 64 Reade St., New York 7, N. Y. Mercer-Proco provides a uniform sheet of Neoprene which is said to resist corrosion and peeling.

N-700 is used where protection against high temperatures, steam, and acids is desired. It coats metal, concrete, wood, floors, and machinery. N-600, an antiskid liquid, is used on ramps, steps, and floors. It air-dries overnight and is available in black, gray, or red. N-200 is designed for heavy immersion services on valves, pumps, pipes, and surfaces subject to splashing.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 331.

New Stripping Shovel

A new excavator with 2 and 2½-cubic-yard buckets is being made by Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis. Using the same base machine as the Model 1005, the high-lift stripper operates with a 50-foot boom and a 36-foot dipper stick. This permits a maximum dumping height of 40 feet and a reach of 60 feet with the boom at an angle of 45 degrees.

The unit features a single dipper stick with cable crowd and a twin-box-section boom. Extra-large sheaves are used to prolong cable life.

The 1005 high-lift model can be converted to crane, dragline, or clamshell. The standard 60-foot crane boom, with a rated lifting capacity of 79½ tons, can be increased to 150 feet including a 30-foot jib. The unit will handle dragline buckets of 2½ to 4 cubic yards or clamshell buckets of 3 to 4 cubic yards.

Normally the stripper is fitted with 42-inch shoes and has an over-all crawler width of 13½ feet and length of 19 feet 3 inches. Its total weight as a stripper shovel is approximately 204,000 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 338.

A dumping height of 40 feet and a reach of 60 feet with the boom at a 45-degree angle are possible with this Koehring high-lift stripping shovel.

ROETH

CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
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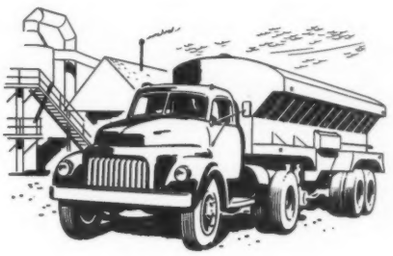
ROETH VIBRATOR CO.
1737 Farragut Ave., Chicago 40, Ill.

Eaton 2-Speeds let truck engines "take it easy"



OFF-THE-HIGHWAY in the toughest kind of going, or making time on the open road, Eaton 2-Speed Axles give truck engines a chance to work in their most efficient and economical speed range. By providing double the conventional number of gear ratios, Eaton 2-Speeds let drivers select the right ratio for every road and load. Stress and wear are reduced not only on engines, but on all power transmitting parts. Eaton-equipped trucks work harder, last longer, cost less to operate and maintain—are worth more on the trade in. Let your truck dealer explain how Eaton's exclusive planetary gearing, forced-flow lubricating system, and other features keep Eaton 2-Speeds on the job, at minimum cost.

EATON
2-Speed Truck
AXLES

Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Accident Prevention Practiced by Kiewit

Safety Program Integrated With Equipment Maintenance And Efficient Job Methods on Air-Base Job

By RAY DAY

• THE cement finisher had finished for the day. Gathering up his tools, he gave a hasty glance around and scooted across the "hot" landing zone on Runway No. 4, at March Air Force Base. When he got to the other side, a Peter Kiewit car drove up and Herb Studer, General Superintendent, his face grim, rolled down the glass.

"I'm sorry you did that, Joe," he said. "We need cement finishers and we need them bad. But you know as well as I do you're not supposed to cross this hot zone on foot. Be back at the office tomorrow morning and get your time. I'm sorry to have to fire you."

What happened to that cement finisher illustrates one of the really firm accident-prevention policies among U. S. contractors. Peter Kiewit Sons, Co., known throughout this country and the world, believes what happened to the cement finisher was a favor to him rather than a personal disaster. Undoubtedly his union assigned him to another project, probably the next day, and he went back to work with a new appreciation of the prudence which makes for effective accident prevention.

Air-Base Job Illustrates Policy

The $6,000,000 March Air Force Base project (see C. & E. M., June, 1952, pg. 54) is not the biggest or the smallest job which Kiewit has had under way recently, but it illustrates as well as any the new safety program which has been developed. No longer is safety a matter simply of accident prevention and lowered insurance costs. In the Kiewit organization, safety is geared directly to effective maintenance and working time on equipment, and to better methods of construction on the job.

For example, Safety Engineer Lloyd Kane made a detailed study of the March Field haul roads every morning, and frequently ordered trucks hauling gravel, concrete, and other supplies to follow a different route. He issued the order to reduce congestion on the haul roads, cut down on transportation time, reduce the severity of driver exposure, and to make the trip easier on equipment. In short, he studied every safety order with an eye to better efficiency in construction.

And he proved that there is a specific connection between those two: safety and efficiency.

In 1944-45, at the same air base, the same organization, including many of the same key personnel, performed the same type of expansion program: grading, drainage, and paving. On that job a hauling unit jackknifed and killed a man, and a B-24 bomber sat down on the cab of a truck and decapitated the driver. When this more recent job was visited, they had worked 121 days without a lost-time accident and they'd shaved something off the regular costs of doing the work.

They channeled as many as 300 vehicles an hour through the entrance gate and sped them to their discharge points on the job without an accident, day or night. They analyzed, from the safety angle, the demolition of a high-octane-gasoline tank farm, and found a way to tear it down more efficiently than their construction estimate had predicted .

Unfortunately, there is no easy way to achieve such results. The only way in which the organization has developed its showing has been through a tough policy of strict adherence to safety rules, through frequent discussions among workmen and key personnel, and through meetings which are held regularly and excuse no one. When a safety meeting falls on the same night as a baseball game, Kiewit officials attend the safety meeting.

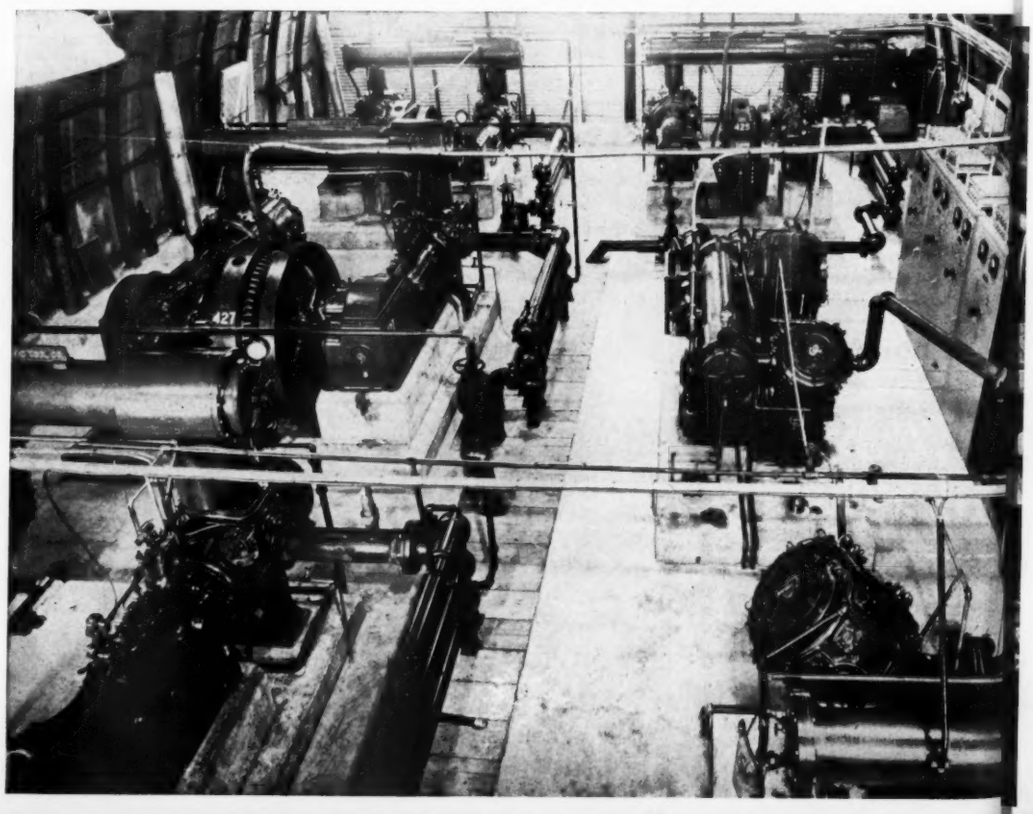
These meetings consist of three principal types. On the first Saturday of each month, all foremen, division superintendents, the general superintend-

(Continued on next page)

Control of traffic on haul roads was a big problem for Peter Kiewit Sons' Co. at March Air Force Base. Flashing lights kept this warning sign visible at night.

CP VIBRATORS on a heavy mass placement job that involved the vibrating of nearly three million cubic yards of concrete.

This installation of six CP AIR COMPRESSORS—four Type O-CE and two Type Y—provides 7000 cfm. of air at 100 lbs. for one of the largest hydroelectric and irrigation construction projects in America.



ent, and representatives of subcontractors get together. At this meeting the job safety record is analyzed, and ways and means of improving it are advanced. Special emphasis is placed on coming construction events, and on methods which will get the work done speedily, safely, and at low cost.

A second type of meeting is held weekly by each construction division, such as earth-moving, concrete, and so on. This is a meeting between the division superintendent and his key foremen. Conducted by the safety engineer or the division superintendent, this meeting is designed to post foremen on their safety standing, to offer solutions to their accident-prevention problems, and to disseminate safety material for their contacts with employees under their supervision.

Following this weekly meeting, each foreman then holds a short conference with his employees, usually during the lunch period. At this meeting, the foremen discuss with the men ways and means of controlling accidents both in the present and in the future. The sense of real participation by employees has proved to be a valuable asset to the program.

Kiewit Safety Engineer Lloyd Kane had this sort of yellow timber warning cross in place within 5 hours after a pilot attempted to land in the middle of a crew on a runway still under construction.

Safety Rules Defined

A few days after the air-base project began, conferences between Kane, Herb Studer, Project Engineer John Alltucker, and many of the division superintendents had produced a working manual of safety specifications for that job. Concise and definite, they formed such a sound base of conduct that CONTRACTORS AND ENGINEERS MONTHLY summarizes them as follows:

General:

1. Stay off live runways at all times. "Live runway" means a runway available for use by aircraft.
2. Workmen must be aware that this is an operating air base with aircraft taking off, landing, and taxiing at all times.
3. When near areas where aircraft are operating, watch the control tower for these signals: (a) Steady green light: proceed as headed. (b) Steady red light: hold position. (c) Flashing red light: get in the clear immediately.
4. Equipment working adjacent to live runways or taxiways at night will keep lights on at all times. Park crosswise to runways or taxiways, so lights will not blind pilots.
5. Equipment operators are responsible for seeing that everyone is in the clear before moving their equipment or vehicle.
6. All vehicles must be parked at least 200 feet from the edge of live runways.
7. All men working around operating equipment at night shall wear reflectorized belts.
8. Personnel riding on trucks shall be seated with legs on the truck, and never over the sides or end.
9. Every injury, however slight, must be reported to the employee's foreman immediately.
10. All injuries requiring the attention of a doctor must be investigated by the foreman, and a report sent to the safety department.
11. Sideboards shall be placed on all flat-bed trucks used for the transportation of workmen.
12. Standard crane signals shall be used, and only one man shall give the signals.
13. No one will be allowed on any equipment except men assigned to that particular unit.
14. Operators must be instructed not to allow anyone to climb on or off moving equipment.
15. Operators of any piece of equipment shall make certain that everyone is in the clear before they move their machines.
16. No one shall be allowed in the immediate area of a crane pickup or swing except the hookup or signal man.
17. All equipment shall be removed from pits, haul roads, and fills for repairing.
18. Any piece of equipment being repaired shall be blocked safely.
19. "Cowboy" drivers will not be tolerated on trucks or any other equipment.
20. Keys must be left in parked vehicles in work areas.

Earthwork:

1. Accepted safety practices on the operation of draglines shall be followed.
2. All cables shall be inspected regularly for defects.
3. All safety guards shall be kept in place at all times.
4. No piece of equipment shall be operated in such a position that any part will come within 10 feet of a power line.
5. Oilers, mechanics, or anyone else working around draglines shall never walk under, or step over, the drag cable.
6. Dragline operators shall place the drag bucket on the ground before leaving the control position.
7. The operator shall always know where his oiler is before moving his machine.
8. Draglines shall be shut down with no moving parts when any hazardous part of the machine is serviced.
9. All haul roads shall be carefully maintained to prevent losing control of equipment.
10. Haul roads shall be routed to eliminate cross traffic.
11. Utmost precaution shall be taken in coupling a tractor to rollers, scrap-

(Continued on next page)

Two 600 cfm. CP PORTABLE COMPRESSORS on big construction job. Gasoline and Diesel driven models are available from 60 cfm. to 600 cfm.

FOR PLUS PERFORMANCE — CP EQUIPMENT

With its tubular chassis and drill carriage, centralized controls, and other special features, the G-300 WAGON DRILL can utilize to full advantage the high drilling speed and strong rotation of the CP 4-inch 70-N Drifter.

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Accident Prevention Practiced by Kiewit

(Continued from preceding page)

ers, etc. Operators shall not move equipment without a proper signal.

12. Stake setters, root pickers, or anyone working on fills or cuts shall stay alert for equipment.

13. A dumpman shall always be used at a dump site.

14. When loading a truck, no equipment shall swing over the truck cab or personnel.

15. All cable controlled parts of earthmoving equipment shall be lowered to the ground whenever the operator leaves the machine.

Bituminous Paving:

1. Mixing Plant: (a) Be sure master switch is pulled "off" and locked before checking or repairing wiring. (b) Blow starting whistle before starting conveyors.

2. Street: (a) Dumpmen shall be at least 6 feet from the truck before the bed is raised. (b) No truck shall be backed until the spotter is in the clear and visible to the driver. (c) Spotters shall have a clear view to the rear of the truck and to the driver at all times.

PCC Paving:

1. A guard shall be placed in front of all machines riding on rails or forms to deflect hands and feet.

2. Guard bars shall be in place on either side of the paver skip. A sign shall be hung from these bars reading "Danger—Stay Away".

3. No one will be allowed on machines except workmen actually working on them.

4. A horn shall be sounded by the operator of the paver before walking the machine.

Utilities:

1. Before picking up any load with a crane, make sure the load is properly balanced.

2. Only the foreman or his designated man shall give crane signals.

3. When working in trenches, men shall stay at least 10 feet away from digging buckets and backhaul.

4. Enter trenches by ladder only.

Structures:

1. Hard hats shall be worn by all men working in trenches and holes more than 8 feet deep.

2. Ladders must be used for entering or leaving trenches or holes.

3. Goggles shall be worn by all men using jackhammers, paving breakers, or chipping hammers.

4. If hairpins are used, they shall be struck with the side of the hammer to eliminate the possibility of flying chips from the hammer or hairpin.

5. All trenches and holes shall be kept free of waste material.

6. All concrete handlers shall wear gloves.

Equipment:

1. Gasoline shall never be used for cleaning parts. Solvent shall be used instead.

2. Hoist chains on mechanics' trucks are to be fastened so they do not swing when the truck is traveling.

3. Welders must wear goggles while cutting or welding.

4. A screen shall be placed to enclose any arc welding.

5. The welder is responsible for preventing anyone from watching arc-welding operations.

6. Keep the shop floor free from oil or grease to prevent slips or falls.

7. All engines must be stopped before making any adjustments close to the fan or fan belt.

8. When inflating a tire, stand to one side to prevent being struck by the lock rim, should it fly.

9. Do not handle cable close to a sheave or drum when winding cable on power units.

10. Always wear gloves when handling old or used cable.

11. Keep all hand tools in good condition.

12. Wear goggles when grinding.

13. Stop all engines when adjusting front power-control units.

14. Always shut off tractor engines when adjusting master clutches.

15. All crane loads of over 2 tons shall be handled by cable slings instead of chains.

16. Use cranks when starting gasoline engines, cupping the hand in such a manner that if the engine kicks, the crank will be pulled from the hand.

All in all, these detailed rules which Kiewit's men follow on the various work phases are sound common-sense ones. Yet they are never complete, because danger always lurks in unseen places as the construction business changes. An incident midway in the job illustrates this point.

Working rapidly, Kiewit's crews had come to the point where the main runway was beginning to take shape. One hazy morning a jet pilot radioed the tower for landing instructions. "Land on the outer runway", he was told.

It so happened that the "outer runway" appeared, to the youthful pilot, to be the one under construction. Obeying his orders, he skimmed the jet in low, head-on for a paving crew and all its equipment. For an instant it looked as if a crash was inevitable, but the pilot cut in his power and zoomed away. Once again he repeated this

(Concluded on next page)

digs 300 belled caissons

two per hour

BELLING BUCKET

USING CALWELD EARTH DRILLS, a contractor completed 300 belled caissons for the building foundation of the new Bret Harte School in San Francisco—boring one every thirty minutes! This is just another example of speeded up production accomplished by contractors through using Calweld *Bucket Type* Earth Drills. Built in 3 models, they bore up to 84" diameter holes to a depth of 200 feet. Eliminate costly hand labor and danger of men having to work underground. Every operation of Calweld Earth Drills is mechanically performed. Interchangeable buckets permit boring in every soil condition. All controls are centered in single unit for easy operation. Built on skid frames for mounting on any truck from 1 to 2-ton or larger.

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CALWELD EARTH DRILLS

BUILDERS "LINK BRAINS TO THE HANDS" WITH NEW 2-WAY PORTABLE RADIOPHONE

CHICAGO, Ill.—(Special)—A fourteen-pound electronic wonder, the Littlefone*, is small alongside the vast mountains of steel and concrete that go into America's mighty dams, but construction engineers wouldn't part with the Littlefone for its weight in uranium.

"When you've climbed a 200-foot scaffolding on a big dam just once," says a veteran chief engineer, "that's when you'd stop and search the world over for a different answer!"

The answer was the Littlefone, a new, two-way portable radiophone that literally "links the brains to the hands" in construction jobs. Work crews even miles away can keep in constant touch with the engineering offices for split-second decisions that speed work, prevent accidents, and save time and money.

TAKE BUCKETS "OFF ICE"

On an upper Missouri River project, the Littlefone was pressed into service to smooth the flow of overhead cement "buckets" — huge buckets of dripping cement that jammed up "on ice" as the workmen say, at the pouring site. The Littlefone, from the pouring site to the filling point miles away, permitted proper timing— and saved thousands of man hours, and tons of wasted cement.

Throughout industry, the Littlefone extends the "voice of authority" into actual field operations. It patrols huge oil tank "farms" to speed reports on fire safety . . . it is a partner with railroaders, miners, lumbermen, oil

Hand Carry Model

and pipeline workers — helping industry to build quicker, more economically, and with greater safety.

Write today for full specifications—find out how Hallicrafters Littlefone can save you time and money. Write Dept. L-C.

*Also available in 9½ pound models.

HALLICRAFTERS, CHICAGO 24, ILL.

performance until frantic signals by the workmen and radio orders from the tower brought him in to the "outer *complete* runway". It was something no one had thought of, of course, but in less than 5 hours' time timber warning crosses painted yellow had been placed on the runway under construction.

"We hadn't realized how fast we were making progress," Kane said, "or how complete the new runway looked from the air."

Kane summed up his part of Kiewit's safety program this way: Accident prevention must be based on sound rules which make sense. Accident prevention starts with the construction planning of any operation, and it must tie in with general construction efficiency and good equipment operation to command respect. And unless an accident-prevention program commands respect, men will not give it the vital day-to-day attention it needs in order to do the most good.

CMA Re-Elects Dillon

James H. Dillon was re-elected President of the Construction Men's Association, New York, N. Y., at its annual meeting in May. His 25 years' experience as foreman, superintendent, and personnel manager on construction projects in foreign countries has enabled him, during his term as President, to put his finger on many bad cases of mismanagement in American construction jobs abroad. A case in point is the waste and the poor hiring procedure and supervision in the construction of overseas airbases, and Mr. Dillon's reports on this are credited with sparking the Senate investigation into the matter.

Total membership of the Association is now 10,300 men in 83 construction categories, and about 75 per cent of the members are working on more than 100 construction projects around the world, for the most part United States defense bases.

Other officers besides Mr. Dillon are: Vice President (re-elected), Louis R. Hyman, sanitary engineer, Jersey City, N. J.; Treasurer, George D. Harvey, material engineer, Mount Vernon, N. Y.; and Recording Secretary, John D. Kapp, office engineer, The Bronx, N. Y. New directors are: Robert Smetana, foreman, Poughkeepsie, N. Y.; J. Patrick Flynn, warehouseman, Palisades Park, N. J.; Edmund F. Boswell, carpenter foreman, Ridgefield Park, N. J.; Clifford G. Anderson, heavy-duty operator, West Haven, Conn.; George Quint, mason foreman, Flushing, N. Y.; Barney Keefer, carpenter superintendent, Selden, L. I.; Arthur W. Kerr, master mechanic, Jewett City, Conn.; and Jesse S. Daves, master mechanic, Honolulu, Hawaiian Islands.

The Association passed two resolutions at the meeting: one condemning the State and Defense Departments for replacing American craftsmen on foreign defense-base jobs with native workers and nationals of other countries as part of the Mutual Aid Pact; and the other denouncing the "one-sided" contracts men are forced to sign to obtain jobs on overseas construction under American contractors.

Link-Belt Reorganization

William L. Hartley, formerly Sales Manager at the Philadelphia plant of Link-Belt Co., Chicago, Ill., is moving to headquarters at Chicago as a specialist in the application of long-haulage belt conveyors and to assist on other major engineering projects. Mr. Hartley has been with Link-Belt since 1915 and has held many posts in Chicago, Kansas City, Detroit, and Philadelphia.

Two other changes in Link-Belt's personnel are: Stuart T. Penick is appointed Sales Engineer to specialize in power-plant coal-handling equipment at the new Link-Belt Colmar plant, north of Philadelphia; and George A. Most, Jr., takes his place as District Manager at Moline, Ill. Mr. Penick joined Link-Belt in 1935 and has served in several of its plants. Mr. Most, who has been District Sales Engineer at the company's Pittsburgh office since 1944, previously served at Philadelphia.

Lanterns and Torches

A folder on utility lanterns and torches is distributed by Handlan, Inc., First, Popular and Plum Sts., St. Louis 2, Mo. The Model 2000 lantern holds 32 ounces of oil and gives 100 hours of burning time. It is 9¾ inches high, 6½ inches in diameter, and is said to burn steadily in all weather.

The Model 605 utility torch has a 3½-quart capacity and a ½ or ¾-inch interchangeable wick, 12 inches long. It is weighted at the bottom to provide extra stability. The burning time is 48 hours.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 293.

Bulletin on New Scrapers

A folder describing No. 10 and No. 15 Caterpillar scrapers is issued by Caterpillar Tractor Co., Peoria 8, Ill. The No. 10 has a heaped capacity of 9 cubic yards and the No. 15 carries 12.5 cubic yards. Both units are drawn by the DW10 tractor.

The bowls and aprons allow incoming material to boil up through the center of the load, the company claims. The surface-hardened self-sharpening blades are set to shear difficult material and direct it into the bowl. The units also feature high apron lift, low center of gravity, open-top bowl, straddle-mounted rear wheels, and reinforced double bottoms.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 330.

"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete buildings, bridges, dams, walls and many other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.
4665-4669 Spring Grove Avenue Cincinnati 32, Ohio

THINGS MOVE FASTER when a "QUICK-WAY" is on the Job!
Reg. U. S. Pat. Off.

FASTER TO and FROM the JOB • 50 M.P.H. on the Highway

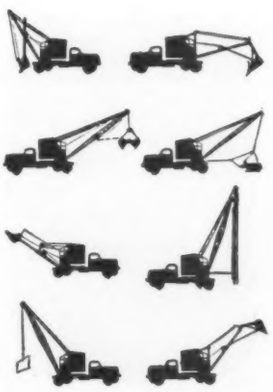
MORE WORK FINISHED ON THE JOB FASTER

You Make PROFITS FASTER

Job Tickets tell the story...*more hours of work each day...more work per hour...lower operating costs...lower maintenance costs*...it all adds up to *bigger profits for you.*

Yes, *QUICK-WAYS make faster profits*—give you fast truck speed between jobs—eight money making attachments—fast working speeds—4 models from 3 to 10 ton crane capacity.

—and quality construction too—all steel for strength and lightness—accurate balance—high capacity to weight ratio. More parts are interchangeable and easy to get at, which simplifies maintenance and repairs. All parts deliver their capacity rating and more. This fine construction means longer life—more profits on a small investment. They're economical to buy. Ask your distributor for a free demonstration.



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Please send me complete details on "QUICK-WAY" truck shovels—four different models for large jobs and small.

NAME_____
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CITY_____ STATE_____

Excavator Features New Foundation Borer

A new standard and heavy-duty ¾-yard excavator and 20-ton truck crane has been announced by the Findlay Division of Gar Wood Industries, Inc., Findlay, Ohio. The right-angle drive, transmitting power through a universal coupling, is said to reduce fuel consumption and eliminate the maintenance, noise, slack, and back-lash problems of chain drives. An optional hydraulic coupling absorbs the shock loads of excavation and, combined with the power-actuated clutches and direct drive, retains the "feel" for smooth crane performance, claims the manufacturer.

Completely convertible in the field to shovel, crane, dragline, clamshell, trench hoe, or pile driver, the Gar Wood 75 is also available with a factory-installed Foundation Borer. This attachment combines belling and boring into one operation for digging footings.

Other features include an all-welded boxed-section machinery deck, a worm-driven boom hoist with a safety lock, nonswaying hooked conical rollers running in a double-flanged path, and vacuum controls for steering and dipper trip.

In addition to the standard-duty and heavy-duty basic machines, the Gar Wood 75 is offered as a 20-ton truck crane, mounted on a 6 x 6 or 6 x 4 chassis designed for high mobility and heavy service.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 310.

The Gar Wood ¾-yard excavator is also offered as a 20-ton truck crane mounted on a 6 x 6 or 6 x 4 chassis—or with a Foundation Borer attachment which combines belling and boring operations in footing work.

Hot-Spray Painter

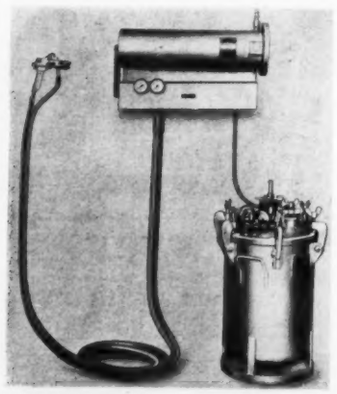
A pumpless hot-spray painting device which can be used with any standard paint-spray system has been placed on the market by Special Equipment Corp., 225 Lafayette St., New York 12, N. Y. Therm-O-Spray applies hot coatings by heating a small quantity of paint a short period of time under constant temperature and pressure just before spraying. Circulating hot air keeps the paint in both paint hose and heat exchanger at constant temperature even during interruptions in spraying. There are no moving parts.

Filtered moisture-free air is first passed through a thermostat-regulated explosion-proof electric air heater, where it is heated to a temperature between 300 and 400 degrees F. This heated air then passes through the heat exchanger and heats the paint or lacquer to the recommended temperature. In the heat-exchanging process, the air is reduced to about 85 degrees F, which is considered the optimum temperature for atomizing, and it is immediately passed on to the spray gun for atomization of the hot paint.

During interruptions in spraying, the temperature of the paint is maintained in all lines by regulating a valve which automatically distributes a certain amount of heated air to the insulated hose and heat exchanger when the spray gun is shut off. Constant and uniform pressure is maintained on the coating material at all times to prevent evaporation or separation of solvents and other deteriorating influences.

The unit consumes 1,400 watts, and is ready for use within 15 minutes after switching on the electric current, the manufacturer says. It has a capacity of 25 to 30 ounces per minute.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 279.



The Therm-O-Spray pumpless hot-spray unit has no moving parts.

Dravo Contracting Promotes

William A. Robinson is Assistant Chief Engineer of The Contracting Division of Dravo Corp., Pittsburgh, Pa. A member of the American Society of Civil Engineers and the Engineers Society of Western Pennsylvania, Mr. Robinson has been with Dravo since 1934 and has served as Field Engineer and Superintendent on a number of large construction projects.

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TODAY, less than three years after the first production delivery, Allison has built and shipped 10,000 Torqmatic Transmissions for Army Ordnance vehicles.

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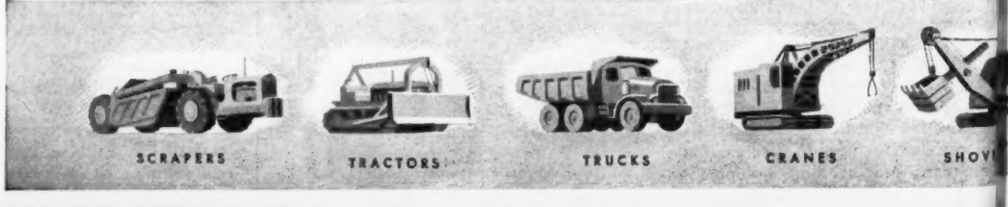
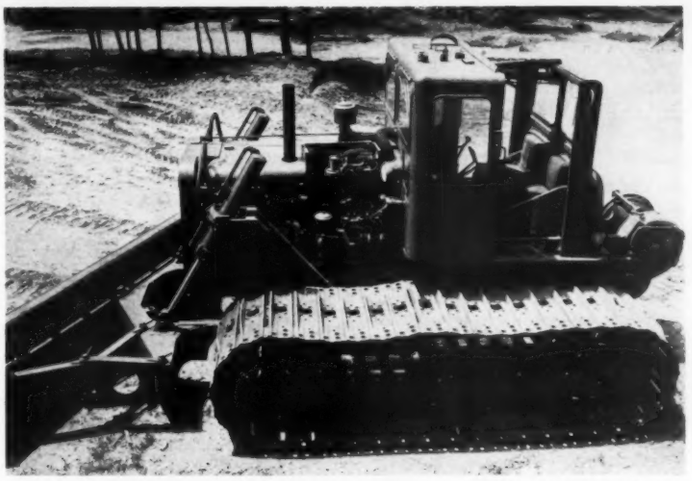


Standard Equipment Is Adapted for Army In Arctic and Tropics

Military demands on earth-moving equipment are quite different from civilian ones, but the Corps of Engineers does not like to have "specials" if modified standard commercial equipment will do. The Engineer Research & Development Laboratories, Fort Belvoir, Va., which develops construction equipment for the Army and Air Force, uses strictly commercial items to save time and money and solve wartime quantity problems.

One reason why commercial earth-moving equipment nearly always has to be modified for Army use, according to John A. Caldwell, Chief of the Mechanical Equipment Branch, is that it must be adapted for military transportation by air, sea, and land. It must not exceed weight and dimension limits of cargo air and surface craft. Also, it must be easy to load, lash down, and unload.

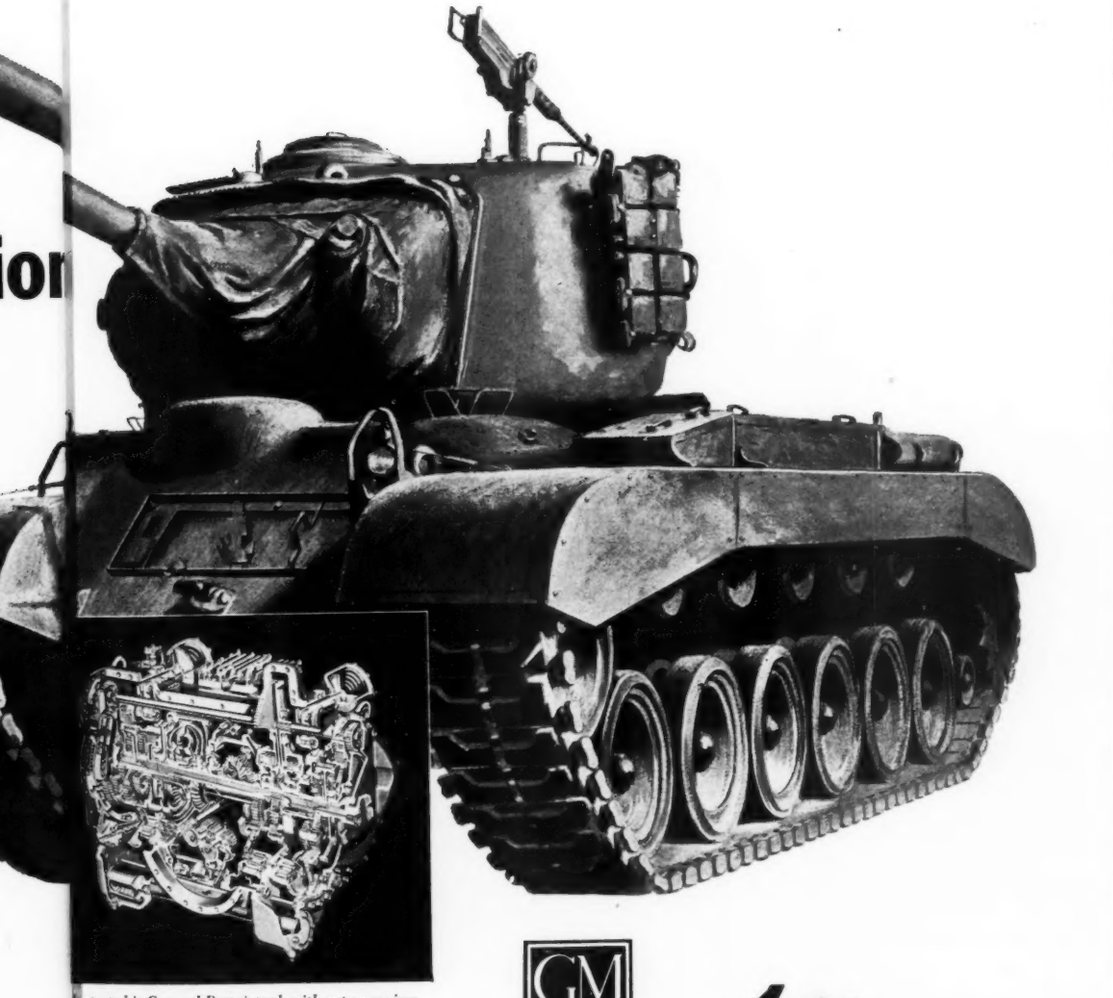


Here is a standard tractor modified to do military construction in the Arctic. It has wide tracks, a dozer with inside-type push arms to narrow the over-all width, and a cab with heater and spring-loaded quick-opening doors. A starting engine replaces the electric starter, and there is engine heating and insulating equipment.

Mr. Caldwell cites an example of crawler tractors for use in building airstrips in enemy territory. Limited landing facilities mean relatively light aircraft, and the answer to that is a 16,000-pound airborne tractor. Caterpillar, International Harvester, Allis-Chalmers, and Oliver have made such crawlers for ERDL: they are regular medium-sized tractors with higher-powered engines, which are stripped of all non-essential equipment and given the track frames and tracks of smaller units. Armor protection for operator and engine, night lighting for round-the-clock operation, and radio suppression of motorized items to prevent radio interference and detection—these are other modifications necessitated by tactical requirements. For landing operations, tractors must be modified for working on the beaches as pushers, cargo handlers, dozers, etc.

Extremes of temperature are another problem in dealing with machines designed primarily for temperate climates. For the tropics, they must be treated against fungi, while marshy conditions call for wider and longer tracks for low ground pressure. With Arctic temperatures such as minus 65 degrees, however, special lubricants and fuel are needed for quick starting, and each unit must be equipped with a winterization kit including heating and insulation for engines, batteries, and cabs. Widely spaced and easily accessible controls, too, are important, when the operator is wearing bulky Arctic clothing.

The final musts for all Army equipment are easy operation and maintenance under all conditions, plus interchangeable parts and assemblies. Tire sizes and plies, wheels, lubrication fittings, etc., are selected from standard simplified lists, and the electrical systems of motorized items are being standardized at 24 volts to conform to the voltage required by other services.



Illustrated is General Patton tank with cutaway view of Model CD-850 Allison Torqmatic Transmission

GM GENERAL MOTORS

Allison

TORQMATIC DRIVES

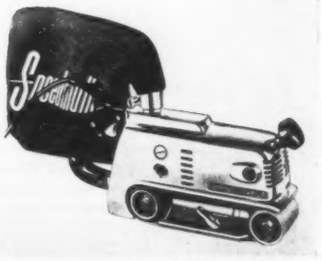
New Dustless Sander

A dustless sander for use on wood, metal, plastic, and glass is made by The Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y. Over 85 per cent of the sanding dust is picked up by the vacuum system of the Model 503 which prevents the belt from clogging. The low-slung large-capacity dust bag stays out of the way of the work and can be moved to the right or left of the rear handle according to the operator's convenience.

A belt speed of 1,120 sfpm permits cool, even sanding. The belt tension device is said to make belt changes easy, and a belt tracking control with a simple knurled-knob adjustment centers the 3 x 24-inch belt on the pulleys.

The Model 503 has a heavy-duty 115-volt ac-dc motor. The machine is 16¾ inches long, 8 inches high, and 5½ inches wide. Its total weight is 15 pounds. The rubber-covered drive pulley is 3 inches wide and 2¼ inches in diameter. The trigger switch is conveniently located and is equipped with a lock button.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 335.



The vacuum system of the Porter-Cable Model 503 sander picks up over 85 per cent of the sanding dust.

This Fiberglas safety helmet weighs 12 ounces and can be adjusted to any size of head.

Line of Safety Hats

A new line of Fiberglas safety helmets and caps is made by Industrial Products Co., 2855 N. Fourth St., Philadelphia 33, Pa. The leather sweatband is adjustable for any size of head, permitting adequate space under the helmet crown to absorb shock. The hats are fireproof and weatherproof, and come in five colors. The helmet weighs 12 ounces and the cap 10 ounces.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 324.

Making Your Excavator Work Harder and Longer

"Ways to Make Your Excavator Work Harder—Live Longer" is the title of a new 32-page booklet offered by Bucyrus-Erie Co., Box 56, South Milwaukee, Wis. It discusses operation for maximum output, lubrication, repairs, extending rope life, and safety.

Under operating hints the booklet recommends developing a well balanced cycle, keeping the machine clean, using mats in muck, and avoiding bunching of trucks. Efficient operating procedures are also listed for shovels, draglines, and cranes.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 351.

Folder on Trenching Unit

A bucket-type trenching unit which attaches to the rear of Ford, Case, and Ferguson tractors is described in literature prepared by Trenchmaster, Inc., 933 S. Fremont Ave., Alhambra, Calif. The Trenchmaster will dig 8 to 24 inches wide, 40 to 64 inches deep, and advance from 58 to about 336 feet per hour, depending on the tractor model. The company points out that the unit is operated by one man and requires less than one gallon of gasoline per hour.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 292.

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Prestressed-Concrete Beams Feature of One-Story School

Simple Design and Construction of Prestressed Structures Demonstrated in Building of Low-Cost School

By MICHAEL A. SPRONCK

• "PRESTRESSED-concrete construction need not be difficult, nor expensive", says Percy Blair, Jr., engineer and contractor of Tulsa, Okla. He proved his point subbing the pre-con work on a low-cost elementary school in Tulsa.

The Robert L. Owen School, a symbol of population growth in the southwest region of the country, has many modern features: extensive use of light-directional glass blocks, radiant heating, tunneled piping, and easily erected precast and prestressed framing members. The Tulsa School Board awarded the contract for it to Homer D. Grammer, a Tulsa contractor, in May, 1951, on his low bid of $400,612. Work started a month later; finished last spring.

Functional Design

F. V. Kershner, AIA, architect of the structure, gets the credit for its neat modern lines and functional style. No waste or fancy "curlicues" eat up tax money on this building.

In plan the structure is U-shaped, 276 x 264 feet over-all, with the base of the U forming the front of the school. The main wings are 181 x 65 feet. The one-story design keeps the building at a sleek 12-foot height, except in the gym area where it goes up to 16 feet.

Low cost was not obtained by sacrificing utility. The school contains 16 classrooms, two offices, two teacher lounges, lavatories, trophy rooms, a foyer, two auditoriums, the gymnasiums, and a boiler room.

Columns Keyed to Foundation

Grammer moved onto the site with an International crawler and LaPlant-Choate scraper to level off the land. The ground had a nice even slope, so all he had to do was carry about 10,000 yards of dirt 600 feet "down the field". An Oliver Cletrac mounting a Heil dozer followed the scraper, dressing up the fill. Then a Byers ⅜-yard hoe excavated the pipe tunnels and the trenches for the wall footing.

When concrete for the spot footings at each of the column points had set, Grammer brought in the precast columns. Blair had made these up, as part of the subcontract, in his plant a few miles away. The Byers, or a Lorain Moto-Crane, held each column on its 4 x 4 footing while carpenters nailed in some 2 x 6 boards as diagonal braces. When a couple of columns had been placed and braced, Grammer started pouring the foundation walls. The columns go right down into the ground and are integral with the foundation walls; a 2-inch-deep 4-inch-wide vertical groove cast in them keys them to the wall. The foundation wall itself, 4 feet deep and a foot thick, is tied to the footings by a double-hooked bar on

(Continued on next page)

Photo Courtesy of Percy Blair, Jr.

Blair uses this 60-ton Simplex center-hole jack to prestress the wires in his girders by groups.

The automatic exhaust pipe cover. Sizes available to fit from 1" to 6-3/16" exhausts, O. D.

WEATHERCAP provides positive year 'round protection for all engines with vertical exhaust pipes: compressors, road pavers, mixers, crushers, generators, etc. Fully automatic—opens and closes instantly by means of engine exhaust. Seals out rain, snow, dirt, insects . . . prevents flooded pistons, cracked cylinder heads, rusted or warped valves. Quality-built of heavy gauge steel with balanced fins made to uniform specifications conforming to engine exhaust pressures. Low in cost — years of service. Immediate delivery. Write today for full particulars and prices.

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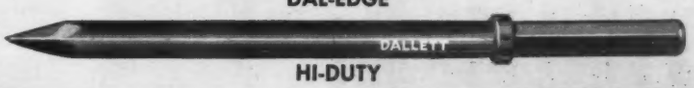

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Prestressed Concrete In School Structure

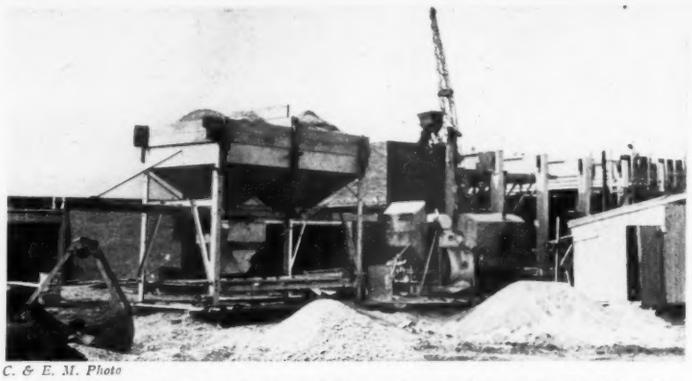
(Continued from preceding page)

each side of the columns.

Carpenters made up the forms right on site. A DeWalt radial-arm saw did most of the cutting. Double 2 x 4 wales and 2 x 4 studs backed up the 4-foot x 8-foot ⅝-inch plywood panels. Universal snap ties secured and spaced the forms. A brush coat of paraffin oil insured multiple re-use of the forms.

Fast Concrete Batching

Concrete for the footing, foundation, floors, etc.—for everything but the prestressed beams—came from a batch plant on the site. A Winslow Binanbatch was the heart of the setup. The Byers crane, fitted with a ⅜-yard Owen clamshell, charged the modest-sized but efficient batcher, working from stockpiles alongside. The Binanbatch then weighed and proportioned the aggregates and fed them into a Jaeger 11-S mixer. Workmen took the concrete to the pours in push buggies—except for one lucky guy who had a power cart.



C. & E. M. Photo

A Winslow Binanbatch was the heart of Grammer's concrete setup. To the right of it is a Jaeger 11-S mixer.

Local suppliers delivered the aggregates in dump trucks—the sand from a pit 6 miles away, and the stone from a crusher 12 miles away. Grammer used Dewey air-entraining cement throughout the job. The spex didn't call for air entrainment, but he felt it saved money in fast and easier placing. The mix was a 1 : 2 : 3½ with 6 sacks to the yard and 6 gallons of water to each sack. That gave a 2-inch slump and cylinders that broke above 3,000 pounds every time.

Floors, Walls

When it came time for the 4 inches of rock fill under all floor slabs, the Cletrac came back into service, dozing the piles down to a near 4-inch level; then workmen hand-graded the rock to the proper surface. The 4-inch concrete floors went in just about the way the foundation walls had; the only change was the application of a gun-sprayed curing compound. Bricklayers then started to work on the outside walls.

Haydite blocks back up the single course of red brick for the outside walls. A 1½-inch space between the two courses acts as insulation. Interior bearing walls are Haydite block, painted with two coats of rubber-base paint.

Glass-block panels cover almost the entire outside wall area in each classroom. The blocks sweep the full length of each room starting from a point 3 feet above the floor and rising right to the spandrel beam. The Insulux blocks, a new type developed by American Structural Products Co., direct the light up to the ceiling. Mortar for these blocks was made with a little larger proportion of cement and a finer sand than that used for the brick work. All mortar joints, both block and brick, were rounded with a jointing tool.

Design of the Pre-Con Beams

Meanwhile P. F. Blair & Son had designed and was fabricating the precast and prestressed portions of the structure. Percy Blair, Jr., is a young man who returned from the war with young ideas. He developed an avid interest in prestressed concrete and now might well be considered one of the "old hands" in this relatively new construction technique. The method Blair uses was originally developed by The Prestressed Concrete Corp., of Kansas City, Mo. With his experience in the field (at present 5 structures using pre-con beams) he has introduced certain modifications in the system.

He made a variety of beams and girders, in many sizes, for the new school. However, all members have a modified-I cross section and they all have one or more wire groups (4, 6, or 7 wires held in a single fitting) slung

(Continued on next page)

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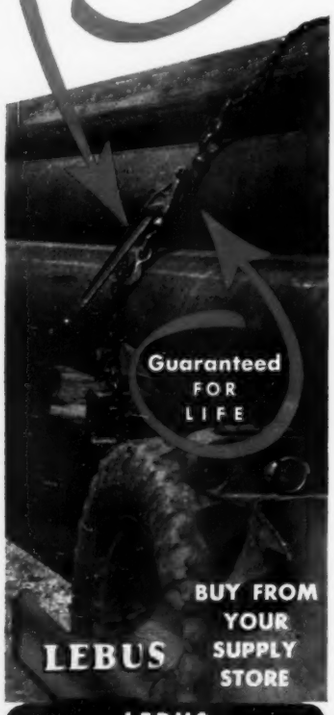

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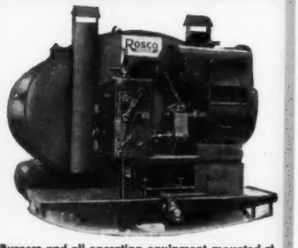

Burners and all operating equipment mounted at rear. Stationary or shifting type spraybars available in three styles.

C. & E. M. Photo

On top of the beams, already poured and prestressed, go precast channel roof slabs, also made by Blair. The little dolly helps move them around.

through their length and anchored at the ends one above the other.

Sixteen pre-con girders, 29 feet 2 inches long and 19 inches deep, support roof joists and slabs over the classroom sections in one wing of the school. The 18-foot precast joists frame into the girders at the third points. Prestressing steel for these girders consists of three 6-wire groups. There are three other girders, 31 feet 4 inches long x 19 inches deep, over the kindergarten. These carry joists that frame in at the one-quarter points and require four 7-wire groups for prestressing. The longest members support the auditorium roof. The nine simple beams are 50 feet 9 inches long, 33 inches deep, and use three 6-wire groups and one 4-wire group for prestressing. There were one or two other sizes on this job but they followed a similar pattern.

All but the nine beams last mentioned were cast and prestressed in the Blair yard. The auditorium beams were cast in place. All of the beams exhibited the accepted benefits of prestressed design: less steel, less concrete, less depth, less deflection, and in this case less cost than similar conventional precast beams.

Fabrication Is Easy

Blair makes his beam and girder forms of 2-inch clear fir, in 16-foot sections for easy handling, and he makes them for assembly with wedges and bolts (no nails) so they will last longer. The 2 x 4 studs are 24 inches on centers. A simple wood cross yoke secures the form at every third set of studs.

He coats the forms with a compound of his own design: 2 pounds of stearic acid crystals mixed with a gallon of diesel fuel, brought to a boil, and applied hot. Some of the forms used 40 times show no grain raising. The last beam comes out as smooth as the first.

When the form is completed, workmen hang the prestressing steel inside in proper position. The wire groups are made up previously and are ready to install just before the concrete pour.

The wires specified for each group are cut to length, threaded through a bearing plate and stressing lug, and headed at each end with a specially built hydraulic heading machine. The cold-formed head on the wire (shaped like a bolt head) prevents the wires from slipping through the stressing lug during the prestressing operation. A fence stretcher holds the wire group taut while it is coated with a waterproof grease or asphalt and spirally wrapped with Sisalkraft paper. The 4-inch rolls were hard to get at the time so they had to be cut to size from 36-inch rolls; a hand saw continually brushed with kerosene did the job where a power saw when it was tried had gummed up.

C. & E. M. Photo

These Insulux blocks face almost the entire wall section of each classroom. They will direct the light up to the ceiling.

Center-Hole Stressing Jack

The wire groups can be coiled in a 5-foot-diameter hoop if they are to be transported or held for use at a later date. They uncoil easily enough when

(Concluded on next page)

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is now available.

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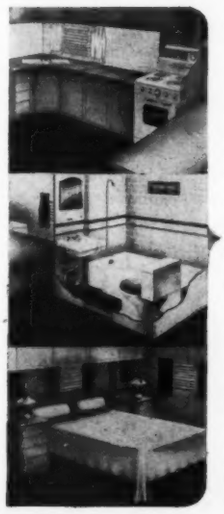

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Prestressed Concrete In School Structure

(Continued from preceding page)

placed in a form. The bearing plates are dropped in a slot in the bulkhead at the ends of the form. Then the end piece of the form is pulled back a bit to give a little tension to the wires during the concrete pour.

Transit-mix or centrally mixed concrete can be used for beams. Jesse O. McMichael Concrete Co. of Tulsa supplies the concrete for Blair, chuting it directly from the truck into the form. Syntron V-55 and V-75 external vibrators insure proper density and complete flow to all parts of a form.

The mix on this job was just about a 1 : 2 : 2½ design—768 pounds of cement, 1,430 pounds of sand, and 1,730 pounds of rock to the yard. That's 8 bags of Lehigh and Dewey high-early-strength cement to the yard with 4½ gallons of water to the sack. The concrete had a 2-inch slump and tested out at 5,800 pounds in 28 days. The design was for 5,000 pounds.

C. & E. M. Photo

Percy F. Blair, Jr., (left) takes samples of concrete for cylinder tests. Truck driver S. L. Fine helps.

Blair strips his forms the day following a pour and sprays the beams with Skeltone curing compound, using a 5-gallon garden-type sprayer. When the cylinders hit 4,000 psi the beams are ready for prestressing.

A pulling rod screws to the stressing lug (threaded for this purpose) and passes through a jacking frame and Simplex center-hole ram. A nut screwed on the back of the rod bears against the head of the ram. The movement of the 60-ton-capacity ram stretches the wire applying the prestressing force. When the wires are elongated the proper amount (stress is proportioned to strain), shims are inserted between the stressing lug and the bearing plates. The jack is then released and moved to the next wire group. *The entire operation takes about 10 minutes per group.*

Later the entire end anchorage is encased with concrete to protect it against fire and rust. The beams can be handled easily with the pickup eyes cast in near the end points. On this job Blair used a Spencer oil-field trailer with a KB6F International tandem-wheel tractor to transport the beams to the job. A TL-20 Lorain Moto-Crane raised them to position on columns and bearing walls.

Blair also made up the precast channel roof slabs, which are 2 feet wide, 4 to 14 feet long, and have a 4 or 6-inch flange.

Grammer put a 1-inch Fiberglas insulation on top of the slabs and finished it off with a built-up 20-year asphaltic roof.

Delaware Picnic Areas

Decoration Day weekend saw the opening of two picnic areas along the southbound lane of Route 13 in the state of Delaware. The Highway Department cooperated with the Delaware State Grange to provide these facilities: the Department graded the areas and placed trash containers on the plots; while the State Grange contributed picnic tables and completed arrangements for them to be used by tourists for picnic lunches. The picnic areas are off the shoulders of the highway and are shaded as much as possible by trees. However, they are not likely to be overlooked, as the Department has erected signs along the highway announcing the motorist's approach to the grounds.

These two new areas are the outcome of an agreement last fall by the Grange and the Highway Department. The Department is keeping a check on tourists' use of picnic areas in order to decide if further plots should be added.

Soil-Sampling Equipment

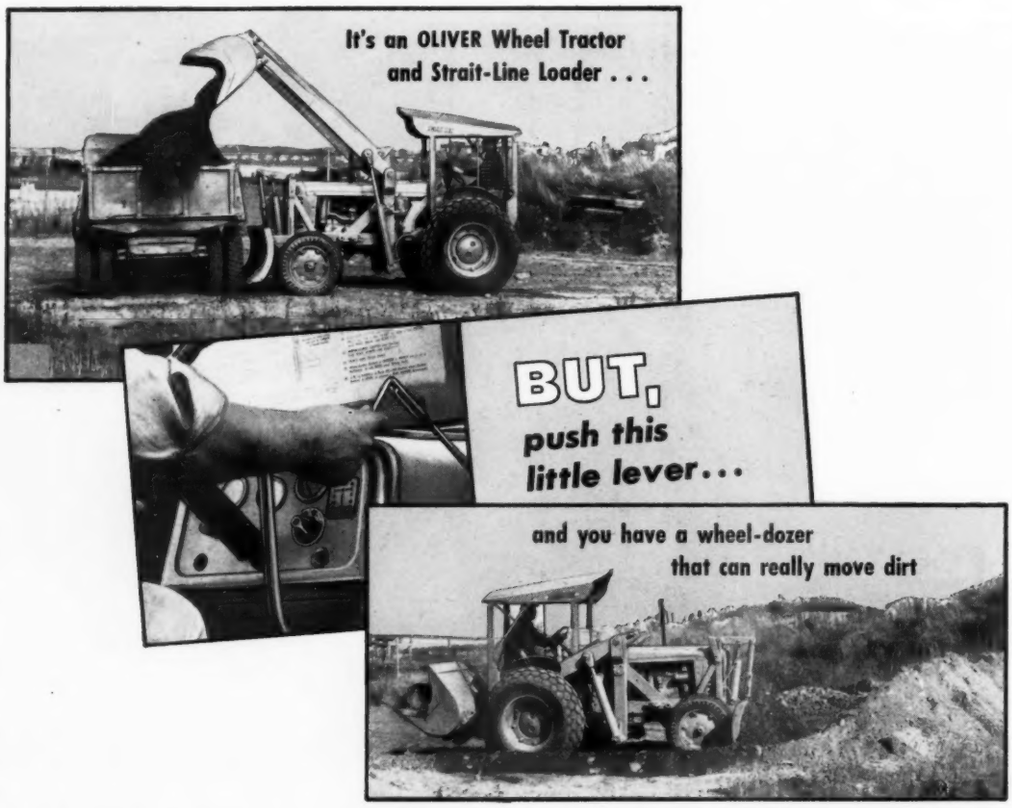
A complete line of soil-sampling tools and equipment is presented in a new 16-page booklet released by Acker Drill Co., Inc., Scranton 3, Pa. Drawings, specifications, and descriptions cover the solid and split-tube samplers, augers, interchangeable shoes, bits, and accessories. Hand-lever rotary drills, gasoline-engine-powered screw drills, and belt-drive units are also illustrated.

The company also makes a truck-mounted hydraulic-feed core drill, complete with derrick that can be quickly raised or lowered by power from the drill. A Jeep-mounted auger-type earth digger makes 16-inch holes in any direction.

This literature may be obtained from the company by requesting Bulletin No. 25, or by using the Request Card at page 16. Circle No. 278.

"Quick Change Artist"

...that saves Your time and money!


It's an OLIVER Wheel Tractor and Strait-Line Loader . . .
BUT, push this little lever . . .
and you have a wheel-dozer that can really move dirt

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You undoubtedly know the advantages of the Strait-Line Loader . . . the loader that digs in back, swings its load overhead, and loads in front. You know that the rear-carried bucket load multiplies traction . . . makes steering easy.

But now, you can get a "quick change" bulldozer and angledozer blade for the Strait-Line. Just push the little lever and, quick as a flash, you switch from loading to dozing. Pull the lever . . . you're ready for loading. Remember, by carrying the loaded bucket in the rear, you get unparalleled traction that puts real "push" behind the blade. It makes wheel tractor dozing a reality! You can load trucks without dismounting the blade.

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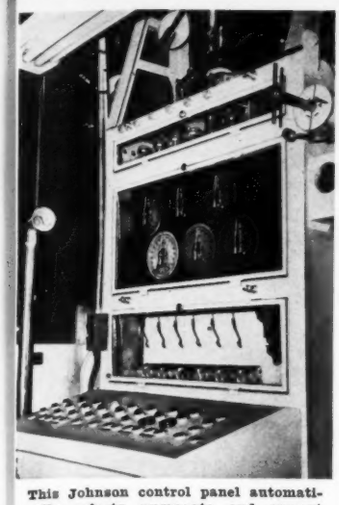

This Johnson control panel automatically selects aggregate and cement batches of 24 different sizes, types.

Push-Button Control For Material Batcher

A push-button control panel that automatically produces 24 different sizes and types of aggregate and cement batches has been developed by the C. S. Johnson Co., R. F. D. No. 1, Champaign, Ill. Working with the panel is a repeater mechanism that automatically rebatches any one selection a predetermined number of times.

The unit is electrically controlled and is installed under the Johnson multiple-compartment aggregate and cement bin. Fully automatic single-material batchers on each compartment are controlled by the central dial scale with a pen that records the weight of each single-material batch. A water batcher and a cement batcher that provides for automatic moisture compensation complete the setup.

A dial on the 24-mix selector panel provides for 2,500-pound or 3,000-pound concrete in ½, ¾, and 1-yard batches. On each size of batch there are four individual selections for 3, 4, 5, or 6-inch slumps. The repeater automatically provides for rebatching of the initial batch one, two, or more times to make up the full mixer charge. The operator sets the mix selector, sets the repeater, pushes the start button, and the plant weighs out the batches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 288.

New Wire-Rope Cutter

A latch-type wire-rope cutter has been developed by Manco Mfg. Co., Bradley, Ill. The Series 15 Guillotine is designed to make a quick cut through wire rope up to 1¾ inches thick, and said to be easily operated. A click of the latch opens the anvil; material to be cut is laid in position; and the main body of the tool is raised back to vertical position which automatically locks it in cutting position. A cutting time of 7 seconds can be obtained, depending on the pump assembly used, the company claims.

The cutter is designed to exert up to 50 tons of thrust, which makes a clean cut through 1¾-inch wire rope. The heavy-duty shear-type blades can be removed for resharpening when needed. The frame is heat-treated high-tensile steel. Oil seals in honed cylinders are designed to prevent oil leakage. The cutting unit is available with electric and air-hydraulic pump assemblies, including a foot lever and a remote-control unit. The cutter weighs 75 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 400.

Shown here with an air-hydraulic pump, the Series 15 Guillotine cuts wire rope up to 1¾ inches.

Automatic Hand Nailer

A magnetic-feed hand-driven automatic nailer is covered in a new folder distributed by Holt Mfg. Co., 651 Twentieth St., Oakland 12, Calif. The unit will take either 1 x 15 floor brads or 3D common flat-head nails. A hopper feeds the nails into position for the blow of the mallet.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 325.

MODEL R HI-WAY SPREADER

Here is the Spreader that *outperforms all others*, as proved by actual field tests and on-the-job figures!

Use it for any type of aggregate from fine sand to crushed stone. It will spread forward or reverse, with control of material flow. By using baffles, you can control the width of the spread from one foot to the maximum. You'll be amazed at *Model R*'s record of operational economy. Available in sizes from 8' through 13'.

MODEL DD TAILGATE SPREADER

Here is the economical *all-purpose, all-weather* Spreader—used in the summer for dust control and for seal coating, and in the winter for spreading sand, cinders or rock salt on icy pavements.

Model DD fits any standard dump truck body and can be attached or detached in one minute. It gives a uniform spread 4 to 60 feet wide, at 1 to 35 miles per hour. *Model DD* will give you years of economical, trouble-free service.

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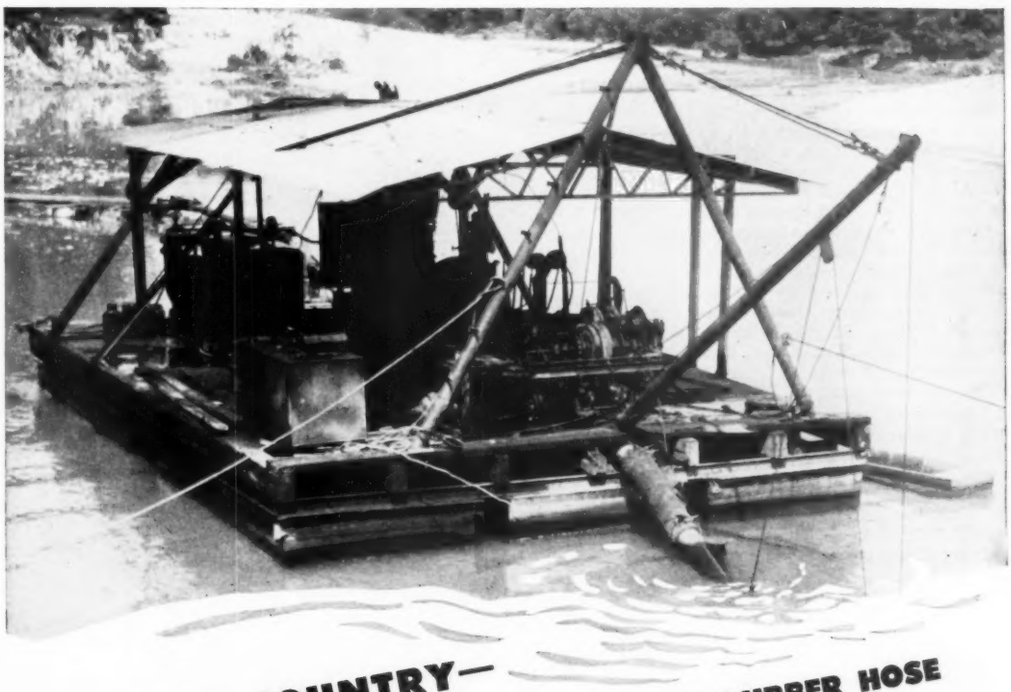
HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA, U. S. A.
MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS



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● In the Louisiana lowlands, building sand and gravel are brought up from river bottom depositories through Republic Rubber Hose . . . tough, flexible suction hose that withstands the unrelenting glare of semi-tropical suns, and the continual cutting/scraping action of razor-sharp material moving uninterruptedly through smooth, abrasion-resistant tubes.

Republic Rubber Sand Suction Hose is internally reinforced by a specially concealed spiral of steel wire which provides for maximum flexing ease and prevents sudden hose collapse.

It's built so tough that, on a dredge like that pictured above, one length of Republic Hose will outlast several lengths of the pipe it's connected to!

Republic Rubber Sand Suction Hose is supplied in all standard sizes, with or without expanded ends, and, like all Republic Rubber Products made for the construction industry, it's available to you quickly and economically through your local Republic Distributor.

Your Republic Distributor is an expert in industrial rubber applications . . . a man who can help you **start** a job faster with the kind of hose and belting that'll get you **finished** faster and **more profitably!** Contact him today or write direct for full facts.

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REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO

Flexible Pavement For National Pike

Dual 24-Foot Pavements Are 15 Inches Thick and Consist of Waterbound and Penetration Macadam Topped by Plant-Mix

• ONE of the many highway improvements currently under construction by the Maryland State Roads Commission is the relocation of U. S. 240, the Washington National Pike, between Frederick, Md., and Washington, D. C. Existing pavement on this winding, heavily traveled, 44-mile stretch of macadam barely accommodates two lanes of traffic. Now being relocated, the upper end of this section of the Pike south of Frederick has two 24-foot pavements separated by a wide center parkway. The flexible-type pavement, totaling 15 inches in depth, consists of 8 inches of waterbound-macadam foundation laid in two 4-inch lifts; a 3-inch penetration-macadam base; and a 4-inch topping of bituminous concrete divided into a 2½-inch binder and a 1½-inch surface course.

This new modern highway is roughly parallel to and west of existing U. S. 240, and is being built on a 200-foot right-of-way with limited-access features. At the upper end it will eventually tie into a proposed by-pass that will skirt the western perimeter of Frederick. Present contracts are pushing the superhighway to a point below Hyattstown, and current plans call for the same general design as far as the Germantown Road, Maryland Route 118, nearly halfway to Washington. The future course of the relocation farther south has not been decided.

On this wide right-of-way the roadways are separated by a 50-foot-wide median parkway strip, depressed at the center with a grade that is 2½ feet below the crown of the adjoining pavement. This drop-off is gradual, being at the rate of 0.073 foot per foot for the first 20 feet off the pavement, and continuing on a 4 to 1 slope for the remaining 5 feet to the center line. A 2-foot-wide gutter along the middle of the median is lined with sod, while the rest of this parkway area is covered with 6 inches of topsoil and seeded.

The pavements are crowned along a line 6 feet from the inner edge from which the slope both ways is ¼ inch per foot. This off-center crown design was selected in order to provide for the possible addition of another 12-foot traffic lane on the parkway side. A future 36-foot pavement would then have a center crown.

Shoulders on the outside of the pavement are 10 feet wide, and slope at the rate of ¾ inch to the foot. The inner 8 feet are stabilized with a 4-inch course of crusher-run stone which is covered with a 1-inch layer of topsoil; the outer 2 feet of shoulder gets 4 inches of topsoil. Sideslopes in fills are either 4 to 1 or 2 to 1, while cut slopes are 2 to 1. Shoulders and slopes are seeded and mulched.

Several Contracts

The over-all project is divided up into many contracts, both bridge and roadway. One of the first bridges built was a grade-separation structure just outside Frederick, at the north end of the relocation, to carry the new route over U. S. 15. Frank Pecora, Inc., of Baltimore, constructed this span at an approximate cost of $390,000.

Major bridge on the superhighway is the crossing of the Monocacy River a few miles below Frederick. This five-span structure, with two 66-foot approach spans, two 115-foot spans, and a 140-foot center span, has a dual superstructure, each side carrying a 30-foot roadway. The Conduit & Foundation Co. of Philadelphia built this one at an estimated cost of $876,510.

A short distance north, another bridge, of shorter span but similar in design, carries the dual-lane expressway over the double-track line of the Baltimore & Ohio Railroad. Empire Construction Co. of Baltimore completed the grade-separation structure for approximately $173,000.

On the Road

As for the roadway, the first contract on the new route began at the bridge separating U. S. 240 and U. S. 15, and continued south for 4.6 miles toward Urbana. The State Roads Commission awarded a grading, drainage, and paving contract for this stretch to W. E. Graham & Sons of Cleveland, N. C., on its low bid of $1,704,368. Work got under way in 1950, but slow

(Continued on next page)

C. & E. M. Photo

A Buckeye spreader distributes fines for the waterbound-macadam base of U. S. 240.

ACCURATE • *Hi-Speed* • FLEXIBLE

FOR BATCHING 2, 3 OR 4 MATERIALS . . . . . •

With more than double the filling area of most batchers, Johnson "Hi-Speed" Roadbuilders Batchers save important seconds in charging time. Big 15" x 36" valves are fast-filling . . . flexible, can be added or removed as needed to handle 2, 3 or 4 materials. For charging into truck mixers, "Hi-Speed" Batcher (illustrated) has a cement plug valve in place of one of the 4 aggregate fill valves. Truck-mixer-type weigh-hopper, available in 2, 3 or 4-yard sizes, has 4 compartments . . . 1 for sand, 2 for aggregates, and 1 enclosed compartment for cement. Double-clam discharge gate is easily tripped, opens wide . . . steep slopes of hopper give fast discharge.

A wide-discharge hopper, for standard 34-E paver batch, is readily interchangeable with truck-mixer hopper on same scale frame. Overhead unit frame supports all fill valves, hand levers, hopper and weigh-beam box . . . provides convenient reassembly, insures accurate alignment of scale parts at all times.

For top batching speed on your jobs, plus extremely accurate weighing for uniform strength every batch, use Johnson "Hi-Speed" Batchers. Call your Johnson distributor today, or write direct to . . .

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JOHNSON *Roadbuilders* BATCHERS

MIX PLANTS • BINS • SILOS • ELEVATORS • CHARGERS • HOPPERS • CLAMSHELL, CONCRETE BUCK

C. & E. M. Photo

Here's a general view of Graham's contract on the Washington National Pike, as workmen with hand brooms brush in fines and two rollers follow up.

progress on the Monocacy River Bridge because of the steel shortage hindered the continuity of the grading operations, and practically cut the job in two. This initial contract is expected to be completed by the middle of this year.

Included in the roadway section, but built under separate contract, are two smaller grade-separation structures. Both were built by the Zerkel Construction Co., Inc., of Rosslyn, Va., and involve county roads. One carries the expressway over Araby Church Road, while the other carries Amelung Road over the newly located U. S. 240.

W. E. Graham & Sons also got the award for the next 2½ miles of roadway, adjacent to its first job, for a low-bid price of $1,237,274. The next project to the south, 1½ miles long, went to the Dutcher Construction Co. of Queenstown, Md. Each contract includes an interchange. Both are of similar design as to roadway section and type of pavement, and are currently under construction.

Grading

Graham handled the grading and drainage items of the contract himself, but sublet the base work and paving to Sam Finley, Inc., of Atlanta, Ga. Earthwork totaled nearly a million cubic yards, of which about 90,000 yards was taken from two borrow pits in order to make a balance. Maximum haul for the job was ¾ mile. Heavy digging was done with an 80 Northwest 2½-yard shovel, while pipe and miscellaneous work was turned over to a pair of ¾-yard rigs—a Northwest and a Lorain.

Long hauls of material were handled with a fleet of 7 end-dump Euclids and 5 Caterpillar DW10's with scrapers. Both types of units averaged about 10 yards a load. For the shorter hauls there were 2 Caterpillar D8 tractors hooked up with 12-yard scrapers. A LeTourneau Rooter loosened up hard-packed ground, thus speeding the loading of the tractor-scraper combinations. Rock fills were spread in 24-inch lifts, while the dirt fills were leveled off in 8-inch layers by 3 dozers—a pair of D8's and one International TD-18. Compaction was achieved with a set of tamping rollers pulled by an Allis-Chalmers tractor, and with a 10-ton 3-wheel roller. Final shaping

(Continued on next page)

C. & E. M. Photo

In front of the Prairie Schooner office of the Maryland state engineers, Project Engineer Donald Brown (left), Finley's Superintendent J. C. Parks (center), and Graham's Office Engineer Arthur Jennette on the Washington National Pike project.

MULTIPLE-PURPOSE JOHNSON ELEVATING CEMENT CHARGER

can be used as a batch plant or transfer plant. For batching, standard Charger has a size 14, 1000-lb. cap. cement weigh batcher, hung under a 33-bbl. storage hopper. To charge dual-batch trucks, two 1000-lb. batchers can be used. Converts to transfer plant by removing batchers and cone, and bolting a 50-bbl. extension to the hopper.

8, 20, OR 30-TON CAPACITY LO-BIN TROLLEY BATCHER

is only 7½′ to 9½′ high for easy charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weight beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Wheels, pneumatic tires and handy tow-bar are optional.

NEW features on Kwik-Mix 16-S DANDIE®

Latest 16-S Dandie concrete mixer, interchangeable side or end discharge, has adjustable double-contact skip shaker, automatic water system, 3-point suspension mounting on heavy coil springs, cast steel drum heads with machined roller paths. Also, exclusive remixing action, Flow-Line discharge. Other models: 3½-S, 6-S, 11-S . . . bituminous, plaster-mortar, mixers, power wheelbarrow

KWIK-MIX (Koehring Subsidiary)
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20-FT.-PER-MIN. Parsons 88 Trenchmobile®

Rubber-tired Trenchmobile drives job-to-job at 12.6 m.p.h. . . . digs 8 or 12 in. wide, 5 ft. deep, up to 20 ft. per min. Sloping ladder boom makes vertical set-ins, undercuts sidewalks, curbs, old mains. Other features: hinged crumber, "Tap-In" digging teeth, reversible conveyor, optional backfill blade. Also ask your Parsons distributor about the 2 wheel-type and 3 ladder-type Trenchliners® . . . all full crawler mounted.

PARSONS (Koehring Subsidiary)
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MORE WORK-TIME with Koehring Dumptor®

With more than a ton Dumptor strength for every ton of payload capacity, Koehring 6-yd. Dumptor withstands severest loading shocks. Sides, end and triple-strength bottom of all-welded body are heavily reinforced. Gravity dump eliminates body hoist maintenance. Same forward and reverse travel speed gives fast shuttle hauling. Check Koehring excavators and cranes.

KOEHRING COMPANY
Milwaukee 16, Wis.

Flexible Pavement For National Pike

(Continued from preceding page)

was done with an Adams and a Caterpillar motor grader.

Waterbound Macadam

A ready supply of stone for the flexible-type pavement was obtained only a mile off the north end of the job at the quarry of the M. J. Grove Lime Co. at Lime Kiln, Md. It was delivered to the site and discharged into spreader boxes by Eastern Contractors, Inc., a Baltimore hauling firm. An average of 12 trucks handled the larger sizes of stone, while 4 sufficed for the dust or chips.

Two Apsco stone spreaders laid the No. 2 stone for each of the 4-inch courses making up the 8-inch waterbound-macadam foundation. The interstices between the larger stones in each lift were filled in with No. 10 stone dust put on by a Buckeye spreader hooked to the tailgate of the trucks. Men with hand brooms swept the dust over the larger stone until all the voids were filled in. During this brooming each course was compacted by constant rolling with a Galion and a Huber 10-ton 3-wheel roller. Stone and dust were then thoroughly bound together by flushing the layers with water applied from a spraybar on the rear of a 2,500-gallon tank truck. Water was obtained from creeks along the right-of-way. More dust was added when necessary, followed by brooming, rolling, and watering as before.

The gradation of the No. 2 coarse stone and the No. 10 dust used in the waterbound macadam was as follows:

Sieve Size	Per Cent Passing	
	No. 2 Stone	No. 10 Dust
1½-inch	100	.....
1-inch	90-100	.....
½-inch	25-60	.....
⅜-inch	.....	100
No. 4	0-10	85-100
No. 8	0-5	.....
No. 100	.....	10-30

Bituminous Pavement

Both the waterbound-macadam foundation, and the 3-inch penetration-macadam base course that went on top of it, were laid to a width of 25 feet on each roadway. This extra 6 inches at the sides provided full support for the plant-mix paving, and checked any tendency to ravel along the edges. No. 2 stone was also used for the penetration macadam, and was put on by the Apsco spreaders. This course was then shot with RT-12 tar, applied at the rate of 2 gallons to the square yard, and covered with a thin layer of No. 3 stone chips. This was followed with a seal coat consisting of 0.5 gallon to the square yard of Maryland A asphalt, topped with a light cover of No. 4 stone.

Gradation of the No. 3 and No. 4 stones used in the macadam and seal was as follows:

Sieve Size	Per Cent Passing	
	No. 3 Stone	No. 4 Stone
1-inch	100	.....
¾-inch	90-100	100
½-inch	20-55	90-100
⅜-inch	0-15	40-75
No. 4	0-5	5-25
No. 8	.....	0-5

Asphaltic concrete for the 2½-inch binder and the 1½-inch surface courses was obtained from the American Asphalt Products Co. of Washington, D. C., which already had a plant in the vicinity to supply a nearby job of its own, now completed. Asphalt used in the mix had an 85-100 penetration. Limestone aggregate was obtained from the supplier of material for the macadam. The bulk of the plant-mix is being done this year.

Quantities and Personnel

Major items in Graham's 4.6-mile contract include the following:

Excavation	841,000 cu. yds.
Borrow	90,000 cu. yds.
Waterbound macadam, 8-inch	176,500 sq. yds.
Penetration-macadam base, 3-inch	138,100 sq. yds.
Bituminous material	278,230 gals.
Bituminous-concrete binder, 2½-inch	18,500 tons
Bituminous-concrete surface, 1½-inch	11,500 tons
Topsoil, 4 and 6-inch	480,000 sq. yds.
Seeding and mulching	377,000 sq. yds.
Solid sodding	72,100 sq. yds.
RC pipe, 18 to 84-inch	15,862 lin. ft.

An average force of 75 was employed

(Concluded on next page)

THE "Master Champ"
HYCYCLE VIBRATOR

ELIMINATES FLEXIBLE SHAFT AND PROVIDES VIBRATION ANYWHERE WITHIN 300 FEET

★ HIGHSPEED VIBRATOR 10,300 RPM. NO EXCESSIVE HEATING DURING NORMAL OPERATION

★ 2 SINGLE PHASE OUTLETS FOR 1200 WATTS LIGHTING

★ THOROUGHLY TESTED

★ COMPACT, LIGHT WEIGHT, VERY PORTABLE. WEIGHS ONLY 172 LBS.

★ WATER TIGHT CONNECTIONS

★ EASILY ACCESSIBLE AND REPLACEABLE FUSES

This new MASTER power unit is really the CHAMP of portable hycycle vibrators . . . it moves easily from place to place on the job as it weighs only 172 pounds. It operates TWO Master Model HV-8 Hycycle Vibrators or 1200 watts of light . . . or one vibrator and 600 watts of light. And best of all . . . IT PROVIDES VIBRATION ANYWHERE WITHIN 300 FEET of the power unit.

The MASTER CHAMP is powered by a 4/4 H.P. Wisconsin gasoline single cylinder air-cooled engine at 3200 R.P.M. The vibrating unit provides high speed vibration at 10,300 R.P.M. Conductor cables and operating vibrator cables are available in various lengths.

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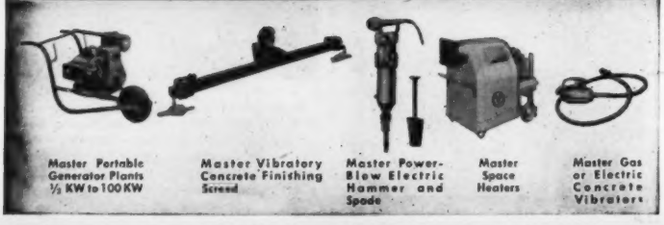

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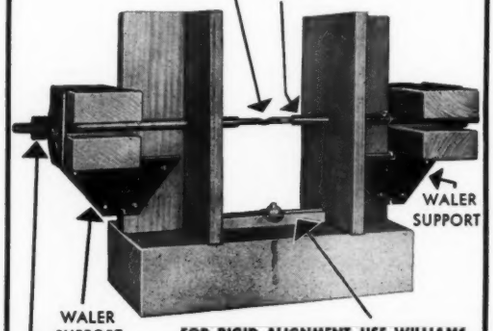
SUPER-HI TENSILE INNER RODS CRIMPED TO ACT AS *JACK-TIES* OR PREVENT *TURNING* OR *PULLING*

CLAMP HAS POSITIVE 1½" OR MORE DISCONNECTION BACK FROM CONCRETE SURFACE



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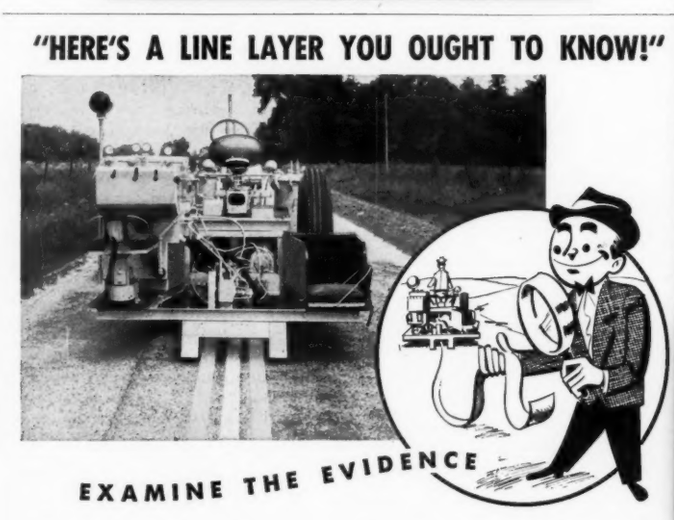

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GALION . OHIO

on the roadway contract. Key personnel for W. E. Graham & Sons included W. E. Graham, Jr., and C. M Atchison, Superintendents, and Arthur Jennette, Office Engineer. J. C. Parks was Superintendent for Sam Finley, Inc.

For the Maryland State Roads Commission, Donald Brown is Project Engineer in charge of all the above projects, and was recently appointed Assistant District Engineer for Construction in the newly created District 7, which includes the area of much of the Route 240 project.

Trailers served as field offices for both the contractor and the state engineers. Graham had a Howard trailer, while the Project Engineer kept his plans and records in a Prairie Schooner.

Russell H. McCain is Chairman of the State Roads Commission, and William F. Childs, Jr., is Chief Engineer. C. A. Goldeisen is Assistant Chief Engineer-Construction.

Truck-Crane Engine

A 6-cylinder engine for truck-crane carriers is announced by The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio. Model 280AM is rated at 184 brake horsepower at 3,000 rpm. It has a 4⅝-inch bore and a 5-inch stroke.

Accessories have been eliminated on the cab side of the engine. The oil filter is normally mounted on the engine nasal bulkhead as is the air-inlet filter. The oil-filler tube and dip stick are accessible from the hood.

A power-steering pump is operated by means of a sheave in front of the air compressor and behind the air-compressor drive. The pulley on the generator permits low cut-in changing, as this type of engine idles a large part of the time.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 290.

Plaster-Mortar Mixer

A new tilting plaster-mortar mixer of 3 to 4-cubic-foot capacity is in production at the Kwik-Mix Co., Port Washington, Wis. Features of the Model 3-P are portability, low charging height, wide-base tires, end-to-end mixing action, and a simple declutching system for fast engine starting.

Equipped with a telescopic tow pole, the mixer can be moved from job to job. It has a 29-inch width for clearing narrow doorways, and a low 37-inch shoveling height for easy charging. Pneumatic tires have a wide base for added stability and flotation.

The 3-P is fitted with four nonclogging saw-tooth blades. Antifriction bearings on the countershaft and paddle shaft are lifetime-lubricated. The mixing drum can be tilted in either direction for quick cleaning. Power is transmitted by multiple V-belts from a standard-make 3-hp air-cooled engine. The simple declutching arrangement on the paddle shaft is designed to take all load resistance off the engine and allows fast engine starting.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 319.

Capacity of this Kwik-Mix tilting plaster-mortar mixer is 3 to 4 cubic feet. It features a declutching sytem for fast engine starting.

Catalog on Line of Scales

A 28-page catalog on a line of scales has been released by The Howe Scale Co., Rutland, Vt. It includes a selection of a thousand standard Howe scales weighing from 1/64 ounce to 400 tons. It gives complete specifications, spot illustrations, and essential information. An index makes it easy to find any scale.

The catalog is conveniently arranged by types of weight indication. Featured are the scales with beam indication, the tape-drive dial, Weightograph projection, and the Teleprint electronic remote weight recorder.

This literature may be obtained from the company by requesting Catalog No. 11, or by using the Request Card at page 16. Circle No. 302.

PREHY Construction Equipment

(Weber system)

TYPE "S" GROUTER & PLACER. INDISPENSABLE EQUIPMENT FOR:—

- Plastic and Fluid Pressure Grouting
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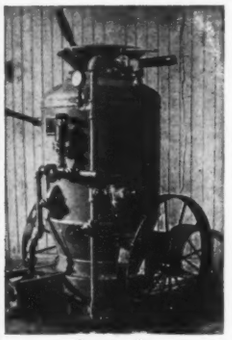
- Soil Stabilization

Type "S" Grouter



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CONCRETE GUN efficiently designed for GUNCON (*gun applied concrete*). For

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Write for descriptive literature. Some dealer franchises available.

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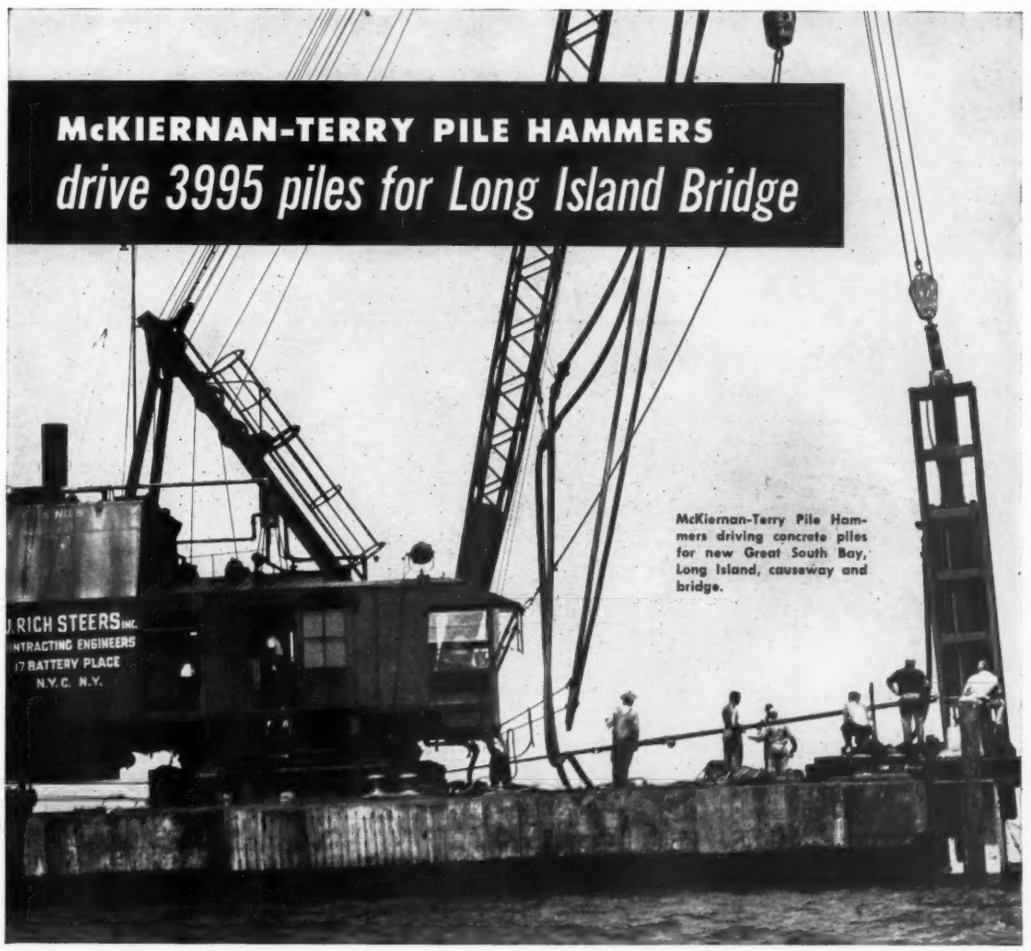
McKIERNAN-TERRY PILE HAMMERS

drive 3995 piles for Long Island Bridge



McKiernan-Terry Pile Hammers driving concrete piles for new Great South Bay, Long Island, causeway and bridge.

A new causeway and bridge, connecting Captree Island and Bay Shore, is currently being built across the Great South Bay in Long Island, New York. The contractor, J. Rich Steers, Inc., selected McKiernan-Terry Pile Hammers to drive a total of 3,995 concrete and timber piles for this project.

A powerful McKiernan-Terry S-10 Single-Acting Hammer was used to drive 697 2-ft square reinforced concrete piles and 148 18-in. square reinforced concrete piles. In addition, 3150 subaqueous timber piles were punched down with a fast-driving McKiernan-Terry 10-B-3 Double-Acting Hammer.

Chances are, wherever you find heavy construction . . . in building bridges, tunnels, subways, cofferdams highways, foundations, water-front improvements and many other jobs . . . you will find McKiernan-Terry equipment at work. Hundreds of contractors rely on the power and dependability of McKiernan-Terry pile hammers and extractors. Bulletin describes complete line, which includes 16 sizes of hammers and 2 sizes of extractors. Write for your copy today.

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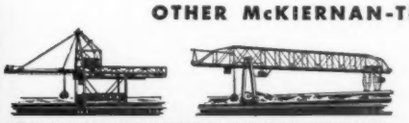

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Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.

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Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

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Typical of the extensive facilities of McKiernan-Terry for unusual jobs.

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Plants: Harrison, New Jersey, and Dover, New Jersey

MK 316

Powerhouse Built on Riverbed

A Raymond rig working on mats beside the Missouri River drives Raymond Step-Taper piles for the powerhouse foundation.

Raymond Step-Taper Piles Are Driven Some 65 Feet Through River-Bottom Overburden to Develop 40-Ton Bearing

By RAY DAY

• ON the shore of the Missouri River at Chamois, 100 miles west of St. Louis, Mo., the clang of pile hammers and the activity which is a part of heavy-building construction is marking a new phase in the rural development of the region. For a new power plant is now under construction. It will house the first 15,000-kw steam-turbine power-generating unit of an installation designed for an ultimate power capacity of 60,000 kilowatts. Central Electric Power Co-Op is the contracting agency, and all engineering, design, and supervision of construction is under The Kuljian Corp. of Philadelphia.

A host of contractors are now represented on the $45,000,000 job. Raymond Concrete Pile Corp. has one of the subcontracts, calling for 65-foot Raymond Step-Taper cast-in-place concrete piles. There is a $1,130,000 contract with Steenberg Construction Co. of Saint Paul, Minn., calling for construction of the main building, the water-intake structure in the Missouri River, site improvement, and a water-treatment building. Steenberg and its subcontractor Raymond Concrete Pile Corp. are now engaged in the

(Continued on next page)

The sheet pile shell is almost down to grade in this pictu Raymond designed the pile hammer and Vulcan made it.

GAR-BRO concrete hoppers

SPEED UP CONCRETE PLACING by using a Gar-Bro Portable Hopper. It receives concrete directly from transit mixers and dispenses it to the pouring crew. With a Gar-Bro Hopper you prevent truck delay and keep wheelbarrows and carts on the go. Because of its low height no ramps or jacking up is required. Dual bins of self-cleaning design have a 125 ft. capacity.

Gar-Bro Hoppers are also available in several floor types and in 10 sizes of single and double gate models; large portable and semi-portable hoppers ranging in capacity from 14 to 135 cubic feet. Each has Gar-Bro patented clamshell type, self closing, grout tight gates.

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construction of the important main-building foundations, which rest in deep overburden on the limestone valley floor of the river. This is perhaps the most critical part of the whole construction, because the valley soil is several hundred feet deep and all piles have to be driven to a pre-engineered bearing of 40 tons per pile.

Modern "Unwalled" Design

The Chamois plant is another example of Kuljian's modern "unwalled" design, in which many of the main plant components are in the open, among them: entrance railroad track from the main line of the Missouri Pacific Railroad; water intake from the Missouri River; screen house; steam-generating unit; forced and induced-draft fans; dust collectors; steel stack; coal-handling equipment and storage facilities; ash-handling equipment and storage facilities; condensate and light-oil storage facilities; and a 134,000-volt substation.

The mechanical design is also quite modern for a plant the size of this. Steam-generating equipment includes a Riley boiler which will operate at 86.6 per cent efficiency and develop 160,000 pounds per hour of superheated steam, delivered at 900-pound pressure and at 900 degrees. The plant will feature pulverized-coal firing, using ball mills to reduce the size of coal particles. There will be a tubular-type air preheater and 4 pulverized-coal burners.

Feed-water regulator devices and a Pacific barrel-type boiler feed pump will be used. Republic controls will be featured throughout the layout. The water-treatment building, where Missouri River water will be clarified and softened before it enters the boiler, will have Permutit water softeners, sedimentation chambers, and filters.

Missouri River Floods

The first contracts were being let when the Missouri River rose to an unprecedented height. When the river crest reached its peak, the water level stood 1.3 feet above the 1903 flood, the highest then on record. When the river went down, it had proved beyond all reasonable doubt that no flood, including the 1951 deluge, would place the building in jeopardy.

The flood delayed the start of construction, but finally on September 3, 1951, work got under way, with 15 calendar months to go to completion of the first 15,000-kw unit.

Concrete-Pile Driving

The powerhouse foundation and associated structures call for 435 Raymond Step-Taper cast-in-place concrete piles, driven in clusters and topped with reinforced-concrete pile caps. Raymond moved in with one of its crawler-mounted land rigs, carrying a 90-foot set of leads, a 75-hp steam boiler, and a single-action hammer built by Vulcan to Raymond's design.

The site was sufficiently soggy—and this was later complicated by fall rains—so that the pile driver had to work from a timber mat. Survey stakes were placed to mark the location of each pile. The metal Step-Taper shells were assembled to one side near the pile driver, lowered into a previously driven shell, and made up on the steel driving mandrel which forms the core of a Step-Taper pile during the actual driving. As a rule it was necessary to hold the shell, partly made up, by a chain, until the top section was centered on the driving core and screwed onto the section hanging by a chain on a previously driven pile. A water jet, with water furnished from the Missouri River by a Chrysler industrial engine-pump unit, was used when required for the first 25 feet of the driving immediately ahead of setting each pile. This jet was a 4-inch pipe, supported in circular brackets on the leads framework and operated from one of the hoisting-engine drums.

A labor crew under Labor Superintendent William Witte (at left, watching) pours concrete in the newly driven Raymond pile shells.

The piles were driven to a calculated bearing of 40 tons, which worked out to about 6 blows per inch of pile penetration. Good progress was made by the Raymond crew, which averaged 10 piles per 8-hour shift for the duration of this part of the work. Several 12-pile shifts were turned in when this work was at its peak, and by mid-

(Continued on next page)

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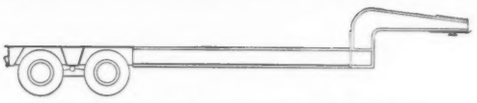
Use "Messenger" Service

Jobs don't come too big for DORSEY Low Beds!

The DuPont Company, prime contractor to the U. S. Atomic Energy Commission, uses this 100-ton drop deck Dorsey MT to haul heavy equipment on construction at the Savannah River Plant.

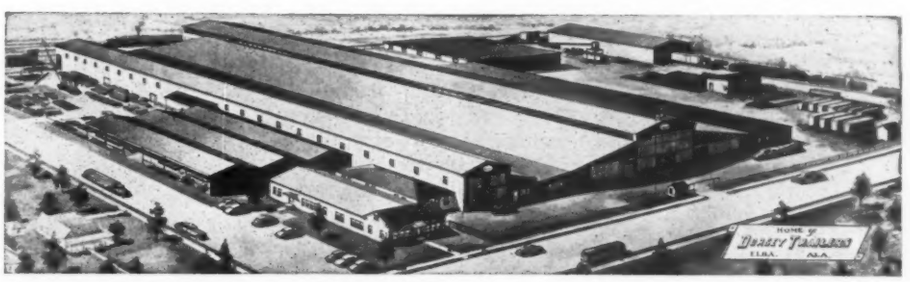


MTS—Ideal for road patrols and all types of construction equipment. The sturdy Dorsey MTS is available in both semi and full trailers, level and drop decks, 15 to 35 ton capacity.

MK—A popular low bed trailer for bulldozers, small shovels and other construction equipment up to 15 tons. Also Model M in 15 to 25 ton capacity and tilt-to-load trailers up to 10 tons.

Experiences on construction jobs all over the world prove the dependability of Dorsey Low Bed Trailers under the toughest conditions. The rated carrying capacity of a Dorsey is purposely conservative, to provide a safety factor with heavy loads over rough terrain.

Beam strength, tire capacity and structural members are all engineered for reserve strength to assure long life and dependable trouble-free operation.



The Dorsey plant—one of the world's major producers of trailers. Here thousands of precision-built trailers roll off modern assembly lines each year. A system of rigid inspection at each stage assures Dorsey Dependability.

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DURABLE DEPENDABLE DORSEY TRAILERS
ELBA, ALABAMA

Vollmar Construction Co., St. Louis, subbed cofferdam construction for the water-intake structure. A Bucyrus-Erie 38-B machine clams out debris ahead of driving.

Powerhouse Built On Riverbed Piles

(Continued from preceding page)

December the Raymond crew had its part of the work entirely completed.

Concreting and Formwork

The steel-pile shells were filled with concrete from Steenberg's mixing plant almost as soon as they were driven. The concrete plant, insulated so foundation concrete could be placed all winter long, is set up at the building site along the railroad spur. It consists of a Johnson batching bin and weighing setup, all manual, enclosed in a wood-and-paper building heated by steam. One Jaeger and one Kwik-Mix 10-S mixer, placed on each side of the plant, mix the batches delivered directly into their skips from the weighing hopper.

A 15-hp steam boiler furnished steam for heat, for raising the temperature of mixing water, and for circulating through the concrete aggregates. These aggregates, which came in by rail from a commercial plant in Pacific, Mo., were unloaded by a Buckeye clamshell to insulated bins.

Freshly mixed concrete was hauled to the placing point by two Whiteman Power Buggies and a MotoBug. Later on, when the pours rise in elevation, the concrete will be hoisted by crane to the proper level and the same powered carts will place the concrete from runways.

Concrete forms for the pile caps consisted of standard wood construction, with shiplap facing nailed to 2 x 4 studs. Most of the form lumber was surfaced

(Concluded on next page)

A McKiernan-Terry pile hammer, handled by the Bucyrus-E machine, now drives steel sheet piling for the cofferdam. Th river-front work was one of the toughest parts of the job.

THE "CURE" FOR LIFE!

Fulco COTTON CONCRETE CURING MATS

Give your concrete jobs the quality finish and long life of the wet cure with Fulco Cotton Mats. Made of tough, cotton materials with thick cotton padding with double-stitched edges and full length stitching 4 inches apart, Fulco mats hold moisture longer and require less soaking — and, they may be used again and again! Top contractors use Fulco Mats to increase the flexural strength, and guard against cracking in roads, bridges, dams, and buildings. For the "Cure for Life" use Fulco Mats on your next job. See your equipment dealer or wire direct for prices.

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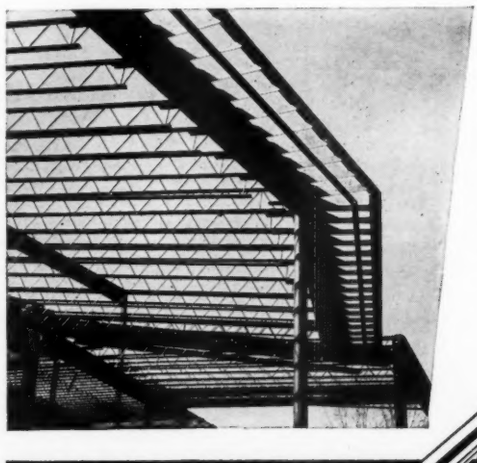

New Scruggs, Vandervoort, Barney department store, Clayton, Mo.
Architect: Harris Armstrong.
Consulting Engineer: Neil J. Campbell.
Contractor: Gamble Construction Co.

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white pine, and all form ties were Superior patented devices.

Cold-weather protection for fresh concrete consisted of weathertight frames, built around the pours by the carpenter crew, and heated from the inside. Several types of heating devices were used. Perfection oil stoves served for some of the smaller pours. Hy-Lo oil heaters heated the larger enclosures, and there was a large steam generator for use on the biggest pours.

Specifications call for concrete strength of 3,000 pounds at 28 days, and pile-concrete strength was 4,500 pounds in the same period.

River-Front Work

One of the toughest parts of the project was some river-front construction in connection with the water-intake structure. This work, which called for a steel MZ-type sheet-pile cofferdam around the construction area, was subbed by Vollmar Construction Co. of St. Louis. It so happened that the location of the water-intake structure fell over the present location of a woodpile dike, built for channel-stabilization purposes by the Army Corps of Engineers. Although the pile dike will be removed, the steel-pile cofferdam was driven through the old anti-scour mat, the rock ballast, logs, and other debris which piled up in past years around the dike.

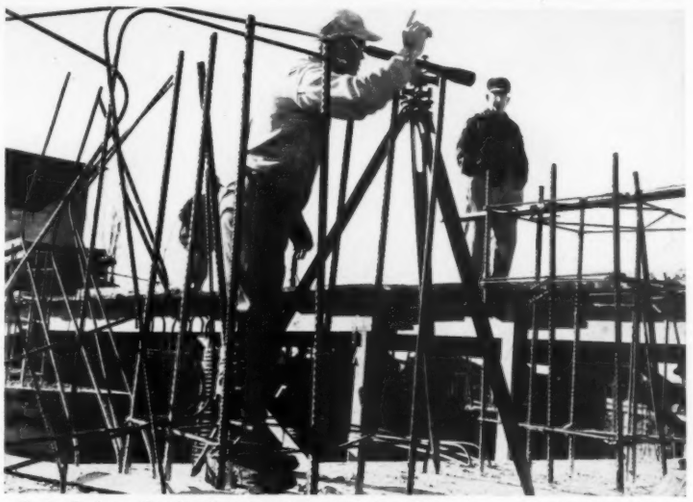
Vollmar came in with a Bucyrus-Erie 88-B crane, mounted on a 40 x 120-foot steel barge. A 100-hp steam boiler and a McKiernan-Terry 9-B-2 pile hammer were also on this barge, and there was a small 80-hp motorboat for maneuvering power.

The first upstream row of steel cofferdam piles was driven directly through rock and debris, but it proved to be so difficult that Vollmar brought in a 1½-yard Owen clamshell bucket for the crane and from that point on clammed out the riverbed ahead of pile driving. That speeded up enormously this part of the operation—which was important because the only time the river is at low stage is during the winter months. Steenberg expected to be out of danger with the intake structure long before the normal spring rises occurred along the river.

Other Contracts

Many other contractors, in addition to those mentioned, are on the project. Watson Bros. of Omaha is doing the steel erection. Natkin Co. has the plumbing, heating, and ventilating. Riley Stoker Corp. is furnishing and installing the boiler and firing mechanism. Fairfield Engineering Co. has the contract for coal-handling equipment, and ash-handling machinery is being furnished by Allen-Sherman-Hoff Co.

The Condenser Service & Engineering Co. is supplying the condensing equipment; Vulcan Soot Blower Corp. is supplying soot blowers; Koppers Co., Inc., is supplying the self-aligning coupling on the ID fan; Darby Corp. is building the 107-foot smokestack; Peerless Mfg. Co. is supplying the circulating-water pumps; Chain Belt Co. is furnishing water screens for the intake structure; and Allis-Chalmers Mfg. Co. is manufacturing the turbo-generator.



C. A. Carlson, Construction Superintendent for Steenberg on the Chamois power plant, is no office superintendent. This picture shows him running his own levels for an important foundation pour. Note the heavy steel reinforcement.

Personnel

All field operations for Kuljian Corp. are under the supervision of Resident Engineer Frank Shaw. Steenberg's contract is being supervised by Project Superintendent R. W. Balgie, Construction Superintendent C. A. Carlson, and Labor Superintendent William Witte.

Early in 1953, power from the Chamois plant is expected to be placed on the transmission grid of Southwest Power Administration, a REA-financed agency which operates the main transmission grid from Bull Shoals Dam, Fort Gibson, and Pensacola Dam, and other important power-generating facilities in the Ozark Mountain region.

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or cause time out

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Hayward Buckets

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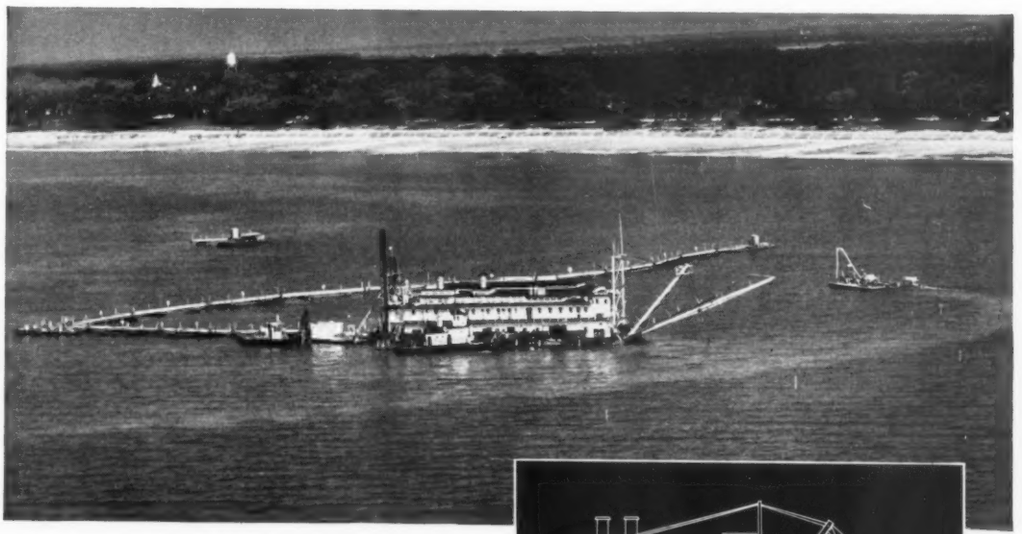

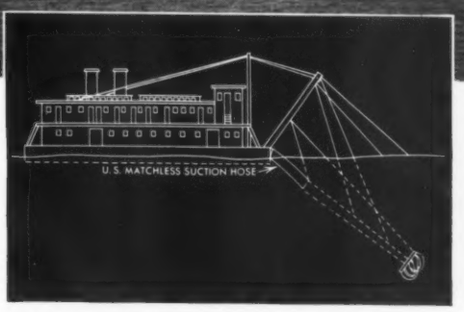

The dredge which has thus far sucked out over 6 million cubic yards of sand to build the 26-mile long beach from Henderson Point, Miss., to Biloxi, Miss., is equipped with U.S. Matchless® Hose. This tremendous job also includes the pumping of an additional 6 million cubic yards of river silt, sand and mud through this same hose. The sloping bathing beach, when finished, will also provide a defense for the sea wall in abnormally high tides. The "U.S." Hose, acting as a flexible connection between the cutter head and the dredge, is still in good condition and has plenty of service life left, despite its rugged treatment. No matter what your hose problem may be, consult United States Rubber Company.

Photo shows dredge pumping sand to make the artificial beach on the Mississippi shore. It extends approximately 1500 feet into the stream. The diagram shows the cutter head which stirs up sand and silt. This in turn is drawn through the pipe, then through the U.S. Matchless Suction Hose to the pump and through the discharge line.

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Give To Conquer Cancer

Rig Screens, Conveys, And Loads Aggregate

A machine that screens, conveys, and loads 1,000 tons of sand and gravel a day is made by J. C. Corrigan Co., Inc., 41 Norwood St., Boston 22, Mass. It consists of a 40-foot portable 24-inch troughed belt conveyor, a removable feeding hopper at the foot end, and a single-deck vibrating screen and two chutes at the head end. An excavator scoops up the raw aggregate and dumps it into the bar-screened hopper. The scraper conveyor carries the material up to a vibrating screen and then to a chute that distributes gravel and sand to separate trucks. The unit is powered by a 15-hp Wisconsin heavy-duty 4-cylinder air-cooled engine. Swivel wheels may be turned at right angles to the machine so that a wider area can be served.

The 6-foot-square hopper is supported by stiff legs. An inclined grizzly with bars spaced about 4 inches apart screens the larger stones and rocks and causes them to roll off onto the groun A slide gate regulates the flow of mat rial onto the belt. A sand chute and gravel chute are suspended at opposi angles from the single-deck vibrati screen. Chutes are covered with a ho that directs the material down into t truck. The conveyor can be quick raised or lowered to suit vario heights and the screen is adjustable various angles and pitches. When t machine is being transported, he screen and chutes can be removed.

Further information may be secur from the company. Or use the Reque Card at page 16. Circle No. 303.

This Corrigan machine can screen, convey, and load 1,000 tons of sand and gravel a day. A heavy-duty Wisconsin engine supplies the power.

New Anti-Rust Paint

A new line of anti-rust paints announced by Chem Industrial Co., 37 Ridge Road, Brooklyn 9, Ohio. Overu features a vegetable-oil base with sp cial chromate pigments added to gi extra protection against rust.

Available in red, gray, green, blac aluminum, and clear, the paints a recommended by the company for u on any kind of metal, interior or ext rior. They can be applied by eith brush or spray directly over rust surfaces, without wire brushing sandblasting, and one coat is said to sufficient to prime, penetrate, and s all metal surfaces. The chromates the paints are said to stop the m severe rust attacks and to resist moi ture, temperature changes, chemica acids, and fumes.

Where colored anti-rust paints a desired, Overust can be used witho the customary colorless primer co Overust clear can be used as a first co prior to the application of any oth type of paint (except lacquer).

Further information may be secur from the company. Or use the Reque Card at page 16. Circle No. 342.

Catalog on Concrete Floor

A 20-page bulletin on concrete floo is available from Flash-Stone Co., In 3723 Pulaski Ave., Philadelphia 40, P High-density Dynapakt floor toppi is obtained by a process which depen upon proper material selection, prop formulation, and power-driven insta lation equipment. It is said to be lon lasting because its extremely den structure is uniform throughout t entire depth. The booklet includes step-by-step comparison of Dynapa low-water-ratio methods, as opposed wet mixes.

This literature may be obtained fr the company, or by using the Reque Card at page 16. Circle No. 399.

A-C Sales Manager

A. E. Dorn is newly appointed Indu trial Sales Manager of the Tractor D vision of Allis-Chalmers Mfg. Co., M waukee, Wis. He succeeds R. M. Sto who has resigned in order to join t Allis-Chalmers distributorship in S Louis. Mr. Dorn joined the company 1934 and had been Pacific Coast Ter tory Manager since 1943.

L. W. Davis, formerly Branch Ma ager at Oakland, Calif., takes Mr. Dor place as Pacific Coast Territory Ma ager. He has been with Allis-Chalme since 1939.

Hydrohoe Travel SPEED Means More Digging Time

This fast-stepping, all-hydraulic Bucyrus-Erie Hydrohoe moves in traffic as easily as your automobile — zips along open highway at speeds up to 50 mph — sets up in three to four minutes — and is ready to take off in equally short order after the job is finished.

Telescoping boom is fully retracted and fits snugly over cab on a strong brace when in travel position. There's no unwieldly extension sticking out to slow down the Hydrohoe — or imperil other traffic. Notice the crane's low super-structures — this speedster slips right through underpasses as low as 12 ft.

With such speed and agility in traffic, the Hydrohoe can handle a number of trenching jobs at widely separated locations — all in a day. In addition, the Hydrohoe's superior maneuverability makes it the natural choice for close quarter digging.

Speed is only one of many Hydrohoe advantages. Equally important is the way the hoe can be converted to crane front-end in the field in as little as four man-hours. Send the coupon for full details.

BUCYRUS-ERIE HYDROCRANE DIVISION
SOUTH MILWAUKEE, WIS.

Here is the Hydrohoe in action. Every work function fully hydraulic. Available with 18- or 12-inch wide dipper. The only dragshovel with *TWO SEPARATE DIGGING ACTIONS!* The first is the conventional dragshovel digging arc. The second—a leveling and smoothing stroke — is obtained by telescoping the boom.

BUCYRUS ERIE HYDROCRANE
South Milwaukee, Wisconsin

☐ Please send Hydrohoe literature.
☐ I am interested in a demonstration.

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RICE

Engine, belt, and electric driven pumps with many new features to give you outstanding performance at low cost. A.G.C. rated. Write for special bulletins.

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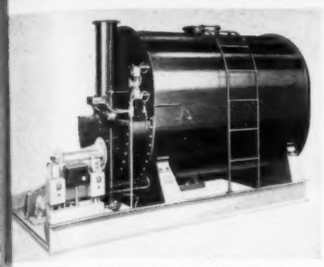
220 N. Milwaukee St. Grafton, Wis.



The Cleaver-Brooks high-temperature oil booster is available in two sizes of stationary electric-driven units.

New Oil-Heating Unit

A heavy-duty high-temperature oil booster has been added to the line of asphalt-heating equipment made by Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis. It is a self-contained fully automatic heating unit operating on a closed heating system vented to the atmosphere.

A semielliptical shell contains the heating element which is free-floating and easy to remove. Adequate space in the top of the unit makes possible double expansion of heat-transfer oil.

The oil booster enables the user to maintain high temperatures in heating bituminous and heavy viscous material employing high-temperature oil. A tight coil system is said to guarantee a negligible loss of heat-transfer oil through evaporation.

The new unit is fired by a pressure-atomizing type of oil burner suitable for oil having a viscosity not exceeding 50 seconds Saybolt Universal. Mounted integrally on the unit are pump, valves, piping, temperature and low-level oil controls, and the electric motor and controls. The entire unit, ready for service-line hookup, is mounted on a heavy channel-iron base.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 280.

Diesel Truck-Tractor

A high-speed truck-tractor powered by the lightweight Cummins JBS-600 diesel engine is announced by Reo Motors, Inc., Lansing 20, Mich. The F-23DT chassis and cab—with 20 gallons of fuel and all tractor equipment except the fifth wheel—weigh approximately 9,475 pounds. The unit has a gross tractor rating of 50,000 pounds and a 130-inch wheelbase.

The Cummins engine develops 150 hp at a governed speed of 2,500 rpm, and 360 foot-pounds of torque at 1,400 rpm. Weight of the complete power plant, including clutch and transmission, is 1,825 pounds. It has a displacement of 401 cubic inches, a 4⅛ x 5-inch bore and stroke, and a compression ratio of 15 to 1. Other engine features include a seven-bearing crankshaft, full-pressure lubrication throughout, and replaceable wet cylinder sleeves.

The F-23DT's turning radius, both left and right, is a few inches over 21 feet. The unit also has a new Timken 2-speed double-reduction axle. Tires are 10.00 x 20 as standard, with 10.00 x 22, 11.00 x 20, or 11.00 x 22 optional.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 296.

The F-23DT diesel-powered tractor recently announced by Reo Motors, Inc., is said to be one of the lightest units on the road in its class. It has a gross tractor rating of 50,000 pounds.

Prepare for Rubber Shortage

For the moment there is an ample supply of rubber, but P. W. Litchfield, Board Chairman of The Goodyear Tire & Rubber Co., Akron, Ohio, warns that there may soon be a shortage. He urges that a national program of synthetic-rubber expansion be undertaken immediately.

Creation of a synthetic-rubber stockpile of 200,000 tons (with the modernization of present synthetic plants) and additional plantings of natural rubber in the Western Hemisphere, to yield 150,000 more tons annually, are part of Mr. Litchfield's plans for a preventive approach to the rubber problem. Natural rubber is subject to violent fluctuations, which are in turn reflected in the American national attitude. This veers sharply between complacency and near panic, he says.

Here are a few facts and figures about rubber, as cited by Mr. Litchfield: The current available supply to meet world needs is 2,750,000 long tons annually; this is made up of 1,000,000 tons of synthetic capacity and 1,750,000 tons from existing stands of rubber trees. World requirements for 1952 will be approximately 2,335,000 long tons, thus leaving a statistical surplus of around 415,000 tons. But—and here's the squeeze—by 1955, world requirements may be 150,000 tons in excess of today's total capacity. And by 1960 these requirements may be not less than 400,000 long tons and possibly as much as 1,500,000 tons in excess of our present potential capacity.

So let us look to synthetic rubber, says Mr. Litchfield, and look now.

Line of Crawler Tractors

A folder on a line of small crawler-type tractors is available from American Tractor Corp., 800 Fort Wayne Ave., Churubusco, Ind. Powered by Continental engines, three Terratrac models are made, with drawbar pulls of 20, 24, and 28 hp. They feature a 3-point hydraulic lift said to provide fingertip control. The units may be fitted with rubber track shoes, power takeoff, dozer, loader, and backhoe attachments.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 275.

TWO LPC TS 300 MOTOR SCRAPERS WORKED 4000 HOURS EACH . . .

with only 50¢ per hour per machine for ALL repairs!

Some of the Other Motor Scraper Features That Cut Earthmoving Costs

- Big capacity . . . 14-yds. struck and 18-yds. heaped . . . to haul bigger pay loads each trip.
- Over 22 mph for speed on the haul road, to make more trips per hour.
- Your choice of power . . . a 280 HP Buda or a 275 HP Cummins diesel for fast acceleration and extra power when you need it.
- Big interchangeable tires for extra traction and flotation.
- Easy loading characteristics that cut valuable seconds off your cycle time.
- Extra high apron lift and positive forced ejection for faster, smoother spreading.

That's really low-cost earthmoving for CONCRETE MATERIALS & CONSTRUCTION CO.

FROM March 1 to December 24, 1951, Concrete Materials & Construction Co. operated their LaPlant-Choate TS 300s two 10-hour shifts, six days a week, stripping 120-ft. of overburden on a job near Cedar Rapids. In 4000 machine hours, total repairs for each rig amounted to only 50¢ per hour, *and that included tires!*

To get ready for the new season, engines were completely overhauled and the only repairs found necessary were new rings and bearings. After 4000 hours, the cylinders showed only .002 of an inch wear!

It's no wonder Concrete Materials is sold on Motor Scraper performance. On top of such low maintenance, their TS 300s give them the kind of power that easily handled materials varying from sandy loam to heavy blue clay in a pit loaded with springs, making the going plenty muddy.

TWO YEARS' WORK IN ONE!

BY working their TS 300 Motor Scrapers two ten-hour shifts a day, with such little time out for maintenance or repair, Concrete Materials & Construction Co. completed two years' work in one. This was a job where the Motor Scraper's ability to keep punching, with little time out for tinkering, really paid off. Minimum maintenance is just another reason why it will pay you to follow the lead of so many big-time contractors who cut earthmoving costs with LaPlant-Choate Motor Scrapers. See your LaPlant-Choate distributor today for complete details about *all* Motor Scraper advantages.

LAPLANT-CHOATE MANUFACTURING CO., INC. CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

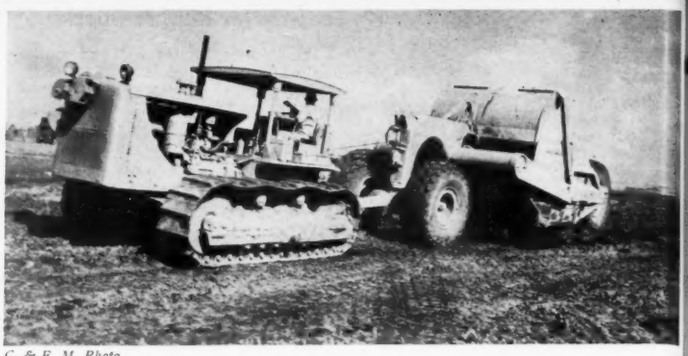
Air Base Made Ready To Accommodate Jets

Runway Is Extended to 7,500 Feet; Apron and Taxiway Are Added to Facilities at Youngstown, Ohio

• RECENT construction at the Youngstown, Ohio, Municipal Airport will permit the U. S. Air Force to use that field as a base for a squadron of jet fighter planes. Among the many improvements to the existing facilities, for use by the military, was the extension of one runway and the building of a new apron and taxiway. The rush project was under the supervision of the U. S. Army Corps of Engineers, Huntington (W. Va.) District.

Located in Trumbull County just outside of Vienna, the Youngstown Airport is 11 miles due north of eastern Ohio's great steel center. Four existing runways, with flexible-type pavements, flare out from the southeast corner of the field, where the control tower and administration building are located. The north-south and east-west runways are both under 4,000 feet; the northeast-southwest runway is 5,000 feet; and the northwest-southeast runway was 4,640 feet in length

Of the four strips, the latter was best suited for lengthening, so a 2,860-foot extension was added at the northwest end to give it a total length of 7,500 feet. The new pavement is also flexible-type, similar to that in the existing runways, and is 150 feet wide. East of the lengthened runway, and parallel to it, is the new 6,600-foot taxiway, 50 feet wide, and built of reinforced concrete. It ties in to the northwest end of the extended runway. About the middle of the taxiway, and adjoining its eastern edge, is the new reinforced-concrete apron, 1,223 feet long x 300 feet wide.



C. & E. M. Photo

A Caterpillar D8 tractor pulls a fill-laden Cat No. 80 scraper on a short haul to the Youngstown, Ohio, Municipal Airport.

Most of the new military installations are grouped around the vicinity of the apron at the northerly half of the field. Commercial interests, which include mail, express, freight, and passenger service on United Air Lines and Capital Air Lines, will function as usual at the southerly half.

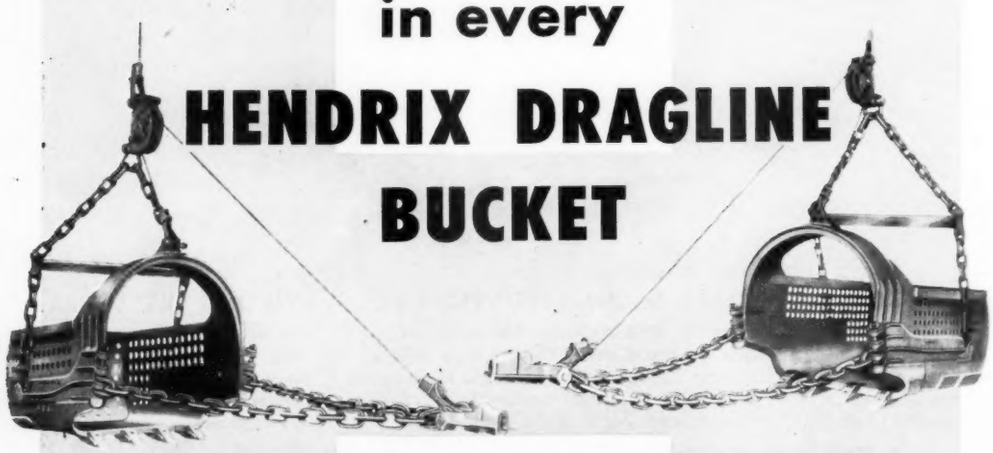
A Rush Job

Like similar work for the Air Force both in this country and abroad, the Youngstown improvement was a rush job. The Corps of Engineers, Huntington District, awarded a contract for the construction of the runway extension, apron, and taxiway to Allegheny Asphalt & Paving Co., Inc., of Pittsburgh, Pa. The estimated cost was $1,946,049, and the project was scheduled for completion within 150 calendar days. Work got under way in June, 1951, but heavy rains through the summer delayed the grading so that paving did not start until September. The jet base will be practically complete this year, permitting its use by the fighter squadron early this month.

Extension of the runway necessitated the relocation of the King-Graves Road along the north side of the airport, thus making room for the 1,000-foot-long clear zone beyond the far end of the strip. Grading, which included 1,441,000 cubic yards of excavation, started a

(Continued on next page)

there's a bucketful of
Cost-Cutting Features
in every
HENDRIX DRAGLINE BUCKET



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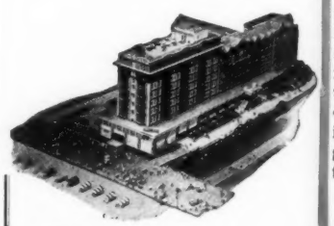
20% TO 40% LIGHTER than other buckets, type for type.
14% MANGANESE STEEL CHAINS, fittings and reversible tooth points.
FULL PAYLOAD every trip—even in wet digging.
PERFECT BALANCE handles easier, fills faster, dumps cleaner.

3 TYPES FOR
EVERY DIGGING PURPOSE
⅜ to 40 Cu. Yds.
Hendrix Buckets May Be Special Ordered Without Perforations

HENDRIX Lightweight DRAGLINE BUCKETS
HENDRIX MANUFACTURING CO., INC.
MANSFIELD — LOUISIANA



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The STRAND, one of Atlantic City's Finest Boardwalk hotels is splendidly equipped to be a gracious and efficient host to every requirement of your convention group.

Ample meeting halls, display rooms, private dining rooms, all combined with complete hotel service and a selected personnel to cater to your every want.

For Special Rate Plan
Address Convention Manager
Hotel Strand, Atlantic City, N. J.

C. & E. M. Photo

A DoMor elevating grader, mounted on a Caterpillar diesel No. 12 motor grader, loads a GMC truck. Truck hauls averaged 2,000 feet.

C. & E. M. Photo

The big tamping roller in front is a Bros, the other a LeTourneau. A Caterpillar D8 tractor pulls them as they help aerate the soil and dry it out.

soon as the site had been cleared. Average elevation at the field is 1,150, and the soil is chiefly glacial till containing a considerable amount of broken rock and boulder fragments. The yellow clay in the till was heavy with water from the frequent summer rains, and had a moisture content of from 20 to 25 per cent when it was excavated.

Grading for the runway was light, but the taxiways, apron, and building area took plenty of dirt. Highest embankment on the job was 20 feet, with the average around 12 feet. Before grading started, a foot of topsoil was removed from the work area and stockpiled for use later on the slopes.

Grading

In the absence of solid rock, no drilling equipment or shovel work was necessary. A Manitowoc Speedcrane with a 1¼-yard dragline bucket dug out some pockets of silt which were backfilled with suitable material. A Lorain ¾-yard backhoe dug trenches as deep as 12 feet for storm drains, and a Unit ¾-yard crane was used to lay pipe. These three machines were the only big rigs employed, since the dirt was moved either by tractor-scraper units or by trucks.

For the short hauls the contractor had 6 LeTourneau RU Carryalls holding 30 yards; 2 LeTourneau W Carryalls of 23-yard capacity; and 6 Caterpillar No. 80 scrapers averaging 18 yards a load. All were pulled by Caterpillar D8 tractors, and were loaded with the help of either a D8 or an Allis-Chalmers HD-19 tractor as pushers. There were also 4 D8 dozers on the job. Later this equipment was supplemented by 4 Caterpillar DW21 scrapers, 3 Terra Cobra scrapers, and 3 bottom-dump Euclids.

For the longer hauls, dirt was moved by 5 assorted 10-ton trucks that were loaded by a DoMor elevator attachment mounted on a Caterpillar diesel No. 12 motor grader. A 30-inch plowing disk on the attachment cut a furrow just outside the wheel line, and the excavated material was fed onto a 42-inch conveyor belt that discharged it into trucks moving alongside the grader. On this phase of the grading the truck hauls averaged 2,000 feet.

Compaction

Lifts for the fills were spread in shallow layers of 3 to 4 inches because of the excessive moisture in the material. Dozers, graders, and tamping rollers helped to aerate the soil and dry it out to about an 11 per cent moisture content, which was near the optimum. Bros and LeTourneau tamping rollers in various combinations achieved this necessary aeration. However, compaction was handled by the loaded hauling equipment, pulled by D8's, which was directed over newly placed layers. Fills were compacted to 90 per cent of the maximum density as determined by modified Proctor AASHO standard method T99-38, except for the top 6 inches, where the specifications called for 95 per cent compaction.

In the construction of the runway, a granular subbase was then put down in two 3-inch courses—except at the last 500 feet which consisted of two 4-inch courses. Kinsman Sand & Gravel Co. of Kinsman, Ohio, supplied the material which was delivered to the job by truck after a 12-mile haul. It was spread by a pair of Caterpillar motor graders—a No. 12 and a No. 112. Over this went two 4-inch base courses of

(Continued on next page col. 3)

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

Notekeeper: W. & L. E. Gurley, America's Oldest Engineering Instrument Maker

A Report to Surveyors

It has been more than a year since the first in this series of "unusual surveying problems and their solutions" appeared in your engineering journals.

Massachusetts survey

The initial page in "The Surveyor's Notebook" showed how a Commonwealth of Massachusetts survey party used captive pilot balloons to get initial lines between stakes separated by heavy timber.

Since then, "The Surveyor's Notebook" has developed into a forum through which veteran field men voice their experiences in solving tough problems and eliminating common surveying hazards—for the benefit of other surveyors and engineers.

A Nebraska deputy county surveyor, for example, has relieved many a headache by explaining how he quickly determined a quarter-section line which was completely blocked by railroad cars. So did Stan Shartle of Danville, Indiana, with his account of leveling over 10 feet of corn.

Joe Thoma

One month, Joe Thoma, the prominent cadastral engineer, gave his remedy for "frozen" tripods; later told of the advantages of the solar transit.

These stories—and letters commenting on them—have come from all over the nation.

Niagara Falls' Corps of Engineers related how it made the first accurate survey of the Niagara River bed with the aid of unusual transit practices. The Chief Locating Engineer of North Carolina has created a great deal of discussion with his plan for improving land survey records.

Through "The Surveyor's Notebook", Gordon Ainsworth told how to get an oil pipeline laid in record time by using a few tricks of the trade.

Gordon Ainsworth

Dick Merritt described the unusual problems of surveying in the Arctic, while Jim Caputo showed how aircraft plants use transits. (His story led to the development of a new Gurley instrument for the industry.)

A great many surveyors have written to us saying that the experiences they read about in "The Surveyor's Notebook" have helped them solve their own field problems. And a number of the engineering colleges have requested copies regularly as classroom aids.

Gurley will continue to be notekeeper for the series; welcomes your comments and suggestions—and, of course, your own experiences.

The first year's stories and surveying tips have been gathered together and reprinted in permanent form. Write for your free copy of "The Surveyor's Notebook" *collection.*

When writing for your bound copy of "The Surveyor's Notebook" stories, ask also for Bulletin 50. It gives full details on Gurley instruments.

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Surveying and Engineering Instruments, Hydraulic Engineering Instruments, Standard Precision Weights and Measures, Paper and Textile Testing Instruments, Reticle Making Facilities, Aeronautical Navigating Instruments, Meteorological Instruments.

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Air Base Made Ready To Accomodate Jets

(Continued from preceding page)

waterbound macadam, with slag used as aggregate.

After a bituminous prime coat the runway was topped with a 2-inch course of special asphaltic concrete that was purchased at the commercial asphalt plant of the Kelley & Meyer Co. in Youngstown. Average truck haul from plant to job site was 14 miles.

The 150-foot-wide runway is crowned at the center, and slopes to both sides on a 1.5 per cent grade. Flanking shoulders, 200 feet wide, have 3 per cent grades. There is a 6-inch underdrain along both edges of the runway.

Taxiway and Apron

The 50-foot taxiway is also crowned at the center, with 1.5 per cent slopes to the edges that are bordered by 50-foot shoulders. Both the taxiway and apron pavements were laid directly on the subgrade, and consist of a 10-inch depth of concrete that is reinforced 4 inches below the surface with welded wire mesh fabric. Paving was done in 25-foot lanes, with sawed transverse contraction joints every 25 feet. Their depth is one-quarter the thickness of the slab, and their width is ⅜ inch. Thus in a 10-inch pavement the joints are 2½ inches deep.

At the longitudinal joints, adjoining lanes were tied together with 1 x 15-inch round bars spaced on 12-inch centers at mid-depth of slab. Joints were edged to a depth of an inch with a ¼-inch-radius tool. Both the transverse and longitudinal joints were poured with Aero-Sealz, a rubber compound that is especially resistant to jet fuel.

A batch plant for the concrete paving was set up near the site of the new apron. Slag for the coarse aggregate came half from the Hubbard plant of the Standard Slag Co. at Youngstown and half from U. S. Steel (Slag Division) Macdonald Plant at Youngstown, while silica sand for the fine aggregate was furnished by R. W. Sidley of Thompson, Ohio. The material was charged into a Johnson four-compartment 250-ton aggregate bin. Cement was supplied by the Bessemer Portland Cement Co. of Bessemer, Pa., and stored in a Johnson 1,400-barrel silo.

Paving with Truck Mixers

Dry batches were fed into a fleet of eight Smith 5½-yard transit mixers mounted on Autocars. Protex air-entraining agent was added to each batch. Water for the mix was drawn from deep wells that were drilled in the ground at the batch plant.

The contractor had 6,000 linear feet of Blaw-Knox steel forms on the job for paving the 25-foot lanes. Excess material between the forms was removed by a Buckeye subgrader before the truck mixers discharged their loads of concrete. Spreading and finishing of the concrete was done mechanically with Blaw-Knox and Jaeger spreaders, Jaeger-Lakewood transverse finishers, and a Koehring Longitudinal Finisher. A Heltzel Flex-Plane machine carried a belt for removing any surface irregularities from the concrete, and also served as a spray rig for applying the Permite curing compound.

Quantities and Personnel

Major items in the contract were:

Excavation	1,441,000 cu. yds.
Embankment	950,000 cu. yds.
Pavement removal	2,000 sq. yds.
Concrete paving, 10-inch	97,000 sq. yds.
Cement	40,800 bbl.
Expansion joints	500 lin. ft.
Subbase course	19,000 tons
Waterbound-macadam base course	26,000 tons
Bituminous prime coat	21,350 gal.
Surface course	7,960 tons
Bituminous material for surface course	500 tons
Seal-coat aggregate	40 tons
Seal coat	1,750 gal.
Pipe, perforated, 6-inch	5,400 lin. ft.
Pipe, 6-inch	175 lin. ft.

(Concluded on next page)

C. & E. M. Photo

Project Engineer E. R. Baughman (left) talks it over with General Superintendent J. J. Smith.

Don't move drifts...

Toss 'Em Aside!

The propeller-type blade of welded steel plate is driven by a power take-off to hurl snow from the road. Here Dakota County (Minn.) cuts down high-piled banks to make plowing of future snowfalls easier.

DOMOR *Snow Blower Kicks Snow From the Roadside!*

Your job is only half-done when snow has been pushed off the road. Strong winter winds keep snow drifting back onto the road . . . deep snow-canyons make travel dangerous and difficult.

But not with the Domor Snow Blower!

This modern tool throws plowed ice and snow far off the shoulder. Winds can't blow hard enough to drift piles back onto the road. Shoulder snow is shallow and travel safe. Snow removal and control is speeded — made more efficient by the Domor Snow Blower!

Add this work-proved Domor attachment to your "Caterpillar" Motor Graders equipped for snow removal. Ask your Domor-"Caterpillar" Dealer for full details—or write direct.

Ulrich Products Corporation, Roanoke, Illinois

The economical addition to a plow and wing equipped "Cat" Motor Grader reaches beyond the shoulder and blows out snow lying at the ditch line. Here a No. 12 of Carver County (Minn.) equipped with a Domor Snow Blower eliminates blow snow at the roadside

ULRICH PRODUCTS CORPORATION

ROANOKE, ILLINOIS

At the peak of construction the Allegheny Asphalt & Paving Co., Inc., had a force of 150 men working on the project. J. J. Smith was General Superintendent.

For the Corps of Engineers, Edwin R. Baughman was Project Engineer assisted by Laurence House. The Huntington District was headed by Col. Walter Kreuger, Jr., District Engineer, until March 17, 1952. Since then work has been done under the general supervision of Col. E. R. O'Brien, Acting District Engineer.

Insure your own personal security and that of the nation by regular investment in U. S. Defense Bonds.

Line of All-Wheel-Drive And Steer Power Graders

A line of all-wheel-drive and all-wheel-steer motor graders is covered in a booklet distributed by Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill. Blade features, hydraulic control, and attachments are illustrated.

The company points out that all-wheel drive puts 30 per cent more power at the blade than rear drive. All-wheel steer, it explains, reduces turning radius, simplifies ditch cutting around curves, and holds the grader under control when working along banks. The blade can be lifted high for cutting banks, extended for widening shoulders, or reversed for grading in difficult places.

Hydraulically operated scarifier, bulldozer, loader, roller, and snowplow attachments are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 270.

Data on Rake Attachment

A bulletin on a rake attachment is available from York Modern Corp., Unadilla, N. Y. It illustrates a number of job applications and gives general specifications. The hydraulically controlled unit is carried on a two-wheel steel frame which is pulled by trucks or tractors. It is furnished with fine or coarse spacing of teeth.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 263.

Van Why for Dixon Crucible

John B. Van Why has joined Joseph Dixon Crucible Co., Jersey City, N. J., manufacturer of silica-graphite paints and graphited lubricants, as a sales representative in Connecticut, Rhode Island, and western Massachusetts. He held a similar position with James B. Sipes Co. before joining Dixon, and has had sales experience with several other companies.

There is a GM Diesel Engine Distributor Near You

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ALABAMA MACH. & SUP. CO.

ARIZONA—Phoenix
O'CONNELL BROTHERS, INC.

ARKANSAS—North Little Rock
LEWIS-DIESEL ENGINE CO.

CALIFORNIA—Berkeley, Fort Bragg
WEST COAST ENGINE & EQUIP. CO.
Los Angeles
ANDERSON-O'BRIEN CO.
Stockton
MOORE EQUIP. CO., INC.

COLORADO—Denver
COLORADO BUILDERS' SUPPLY CO.
(Equip. Div.)

CONNECTICUT—Hartford
HOLMES-TALCOTT, INC.

FLORIDA—Jacksonville, Miami
GENERAL MOTORS CORP.
Florida Diesel Engine Sales

GEORGIA—Atlanta
BLALOCK MACH. & EQUIP. CO.
Savannah
MORGANS, INC.

IDAHO—Boise, Idaho Falls, Twin Falls
SOUTHERN IDAHO EQUIP. CO.

ILLINOIS—Bellwood
D. D. KENNEDY, INC.

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STEPHENS-JONES, INC.

KANSAS—Grand Bend, Wichita
DIESEL EQUIPMENT CO., INC.

KENTUCKY—Lexington, Louisville
BOGIE EQUIPMENT COMPANY

LOUISIANA—Grand Island, Harvey
GEORGE ENGINE CO., INC.
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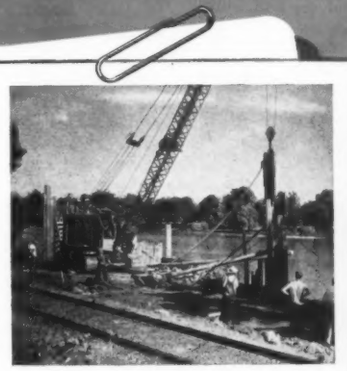
GREAT LAKES DIESEL CO.
Columbus
CENTRAL OHIO TRACTOR CO.
Steubenville
RAY C. CALL COMPANY

GM DIESEL CASE HISTORY No. 516-2

USER: Mancini-Miller-Thompsen Co., East Detroit, Michigan

INSTALLATION: GM 6-71 Diesel, powering an Ingersoll-Rand Gyroflow 600 cfm compressor, which supplies air to a McKierman-Terry 9B3 double-action hammer.

PERFORMANCE: GM Diesel engine in this compressor does the work of two engines powering 500 cfm compressors formerly needed to drive hammer. Fuel costs are halved. GM Diesel saves 15 minutes starting time.



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and cuts costs in half

Here's another application where the compactness and high-speed power of General Motors 2-cycle Diesel engines save money for contractors. With power on every piston downstroke, instead of every second downstroke as in 4-cycle engines, a GM Diesel delivers plenty of smooth, steady power. It gets more work done in less time because it accelerates faster. It starts at the push of a button and is easy to operate and maintain. Compactness of this power-packed engine enables it to fit in about the same space as gasoline engines of comparable power—providing savings of 40% to 70% on fuel and maintenance. See your GM Diesel distributor or write us for full information.

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SINGLE ENGINES . . . Up to 275 H.P. MULTIPLE UNITS . . . Up to 800 H.P.

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New Rear-Dump Wagon

A hydraulically operated rear-dump wagon has been added to the line of earth-moving equipment made by La-Plant-Choate Mfg. Co., Inc., 2920 First Ave., Cedar Rapids, Iowa. The TR200 features a stable wheelbase and 4-wheel air brakes which permit it to be backed over the edge of a fill.

The obstruction-free body interior plus the 70-degree tilting angle is said to assure complete discharge of material. Oak-plank fillers in the bottom of the body absorb loading shock. The unit travels 22 mph on 21.00 x 25 24-ply Rock Lug tires.

The 2-wheeled rubber-tired T200 tractor that powers the wagon can also be used with the TS200 scraper. It carries either a 165-hp Cummins or a 176-hp Buda diesel engine. A steel cab with removable safety-glass doors and windows is also available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 282.

The TR200 Motor Wagon joins LaPlant-Choate's line of earth-movers. It is a hydraulically operated rear-dump. Its tractor is also used with the TS200 Motor Scraper.

Resurfacing Old Pavements

In 1945 the Highway Research Board appointed a Committee on Salvaging Old Pavements by Resurfacing to study a problem made acute by the lack of funds for highway construction and reconstruction. The Committee's report, presented at the Thirtieth Annual Meeting of the Board, forms the subject of HRB Bulletin No. 47—"Salvaging Old Pavements by Resurfacing".

The bulletin describes ways to resurface pavements with portland-cement concrete and with bituminous materials, and includes examples and illustrations. It discusses basic considerations involved in resurfacing, and suggests the approach to take in formulating a rehabilitation program. There are two appendices, one listing definitions of bituminous pavements according to Federal classification; and the other, definitions of terms used in pavement-condition surveys.

HRB Bulletin No. 47 may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The price is 60 cents.

Truck Hoists and Bodies

A catalog on truck hoists and dump bodies is available from Hercules Steel Products Corp., Galion, Ohio. The internal operation of the Speedraulic hoists and the rugged features of the truck and trailer bodies are illustrated.

The heavy-duty hoists get power from a straight-line drive, with a slip joint from the power takeoff to the hydraulic pump. Bridge-type lift arms of heavy steel plate and I-beam-section load arms transmit power to the dump body.

Both square and semiround-nosed bodies are made for mounting on the single-axle 16-foot trailer or the tandem-axle 18-foot trailer body. A number of truck body features are also covered in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 264.

Macwhyte President Dies

Jessel S. Whyte, President and General Manager of Macwhyte Co., Kenosha, Wis., manufacturer of wire-rope products, died on May 28 at the age of 61. While still in his teens, Mr. Whyte started his career with Macwhyte Co. in 1905. Later, after completing post-graduate studies and apprenticeship in metallurgy, he returned to the firm in 1914. Mr. Whyte was well known as a progressive industrialist and civic leader, and was on the boards of various companies and associations.

"Tag Master"
—Combination Tagline Winder & Dipper Trip
ADVANTAGES THAT MEAN "More Yards per Hour"

1. Tagline pull is adjustable to any job.
2. Tagline pull remains uniform at truck level or 70 feet below machine.
3. Tagline pull is automatic.
4. Tagline pull can be increased instantly to manipulate a clamshell or grapple.
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7. "Tag Master" permits digging over a 25-foot range without moving boom or machine.
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9. It's easily converted to a Dipper Trip for use with a shovel front.

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Please send "Tag Master" details.

Make of our machine .....

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From 1½" to 10"
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You can always depend on Sterling SRD* Self Priming Centrifugals. These rugged, heavy duty pumps are specially designed for dewatering on construction job —they NEVER CLOG, NEVER STOP as long as they have fuel! They pump continuously without attention all day, all night!

Sterling trash handling impeller is automatically self cleaning...recirculating priming action is automatic, never fails...suction check valve positively seals repriming water in pump body...plus many more advantages that make these the MOST DEPENDABLE PUMPS MONEY CAN BUY!

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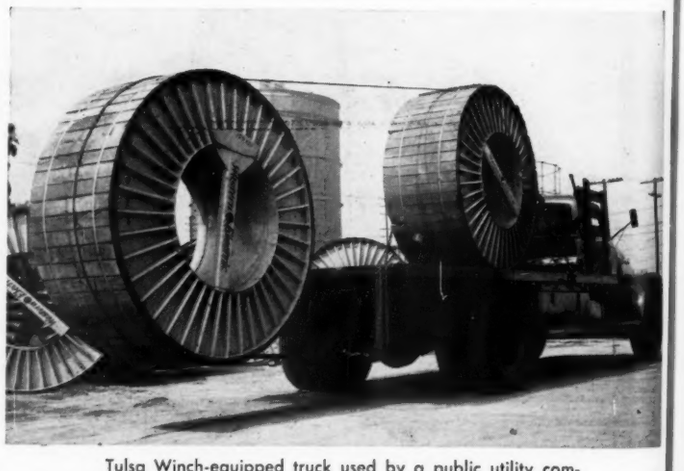
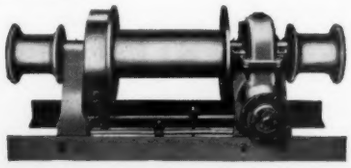
in construction, oil fields, public utilities and commercial hauling, the favorite time and labor saver is a Tulsa Winch. Literally hundreds of heavy and difficult jobs can be handled quickly, easily and safely with a Tulsa Winch. Heavily constructed of the finest materials, Tulsa Winches pay for themselves every day through untroubled performance. Equip your trucks and crawler tractors NOW with Tulsa Winches.



Tulsa Winch-equipped truck used by a public utility company shown loading 3-ton cable reels with a Model 23 Tulsa Winch.



Tulsa* Winch
TULSA, OKLAHOMA
DIVISION OF VICKERS Inc.
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Water Main Is Laid Across River Bottom

M-C & S Lowers 64-Inch Pipe in 300-Foot Sections From Trestle At Location Inaccessible to Floating Rigs

By WILLIAM H. QUIRK,
Editor

• UNUSUAL job problems generally call for special methods, and these, in turn, draw on the resourcefulness and ingenuity of the contractor. Plenty of both was demonstrated when Merritt-Chapman & Scott Corp. of New York City laid a 64-inch main across the bottom of the Charles River to carry water from Boston to Cambridge, Mass. The work was done for the Water Division of Boston's Metropolitan District Commission.

Ordinarily, the task of laying even such a big pipeline across a 600-foot-wide river would be routine for the big derrick boats of M-C&S. A little over a year ago, for instance, three of this same contractor's floating rigs teamed together, in one operation, to lift a 568-foot length of concrete-encased natural-gas main and, lowering away in unison, dropped it into place in a trench beneath New York City's Harlem River.

Such would have been an easy way to do the Boston job. The site in the Charles River, however, is upstream a few miles from Boston's Inner Harbor, and several low-level bridges made it impossible for the contractor to tow in the necessary floating derricks to do the job. Denied the use of heavy equipment, M-C&S had the choice of laying the pipe piece by piece, then joining the pieces underwater; constructing cofferdams and doing the work inside them section by section (both slow and costly methods); or finding still another way. After considerable study, another method, faster and more economical, was worked out on the drawing board and put into execution in the field.

The Alternate Way

Briefly, the plan called for the construction of a work trestle out into the water, spanning half the width of the river, first from one shore and then from the other so as not to interfere with boating. On this trestle the lengths of pipe were welded together; then they were lowered in 300-foot sections into a trench previously dug across the bottom of the river. This done, the two long sections were fastened together under the water, and their plugged ends burned open.

The new welded steel pipe is made of ⅝-inch plate and has a 64-inch inside diameter. It was furnished in 34-foot lengths by Continental Copper & Steel Industries, Inc., Walsh Holyoke Boiler Works Division, of Holyoke, Mass. Before sinking, the pipe was encased in a 10-inch ring of reinforced concrete, giving the main a total diameter of 84 inches. It has a length of 544 feet across

(Continued on next page)

Merritt-Chapman & Scott Corp. Photo

A Lorain 80 crane with a 70-foot boom digs a trench in the bottom of the River Charles for the Boston-to-Cambridge, Mass., water main. Sections of the 64-inch pipe are lined up in the foreground.

THE Quinn Standard FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.
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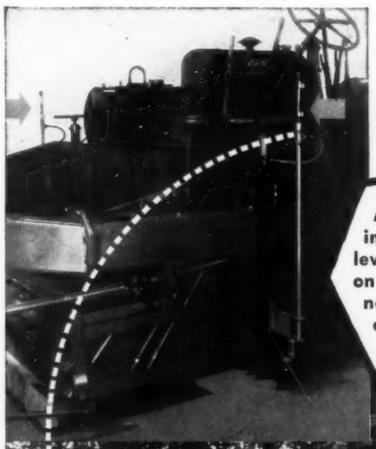


AT LAST..

Adnun Liquid Level: Vertical reading glasses can be set for absolute level or plus or minus. Being mounted on the Cutter Bar Supports and connected by tubing, liquid is directly affected by slope of Cutter Bar.

Reading Glass Detail

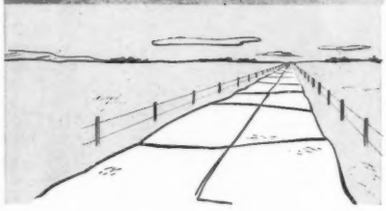
Positive Leveling Control for Black Top Paving!

- Level up old road perfectly and positively
- Correct accurately for any slope at any station
- Holds level grade without modifying desired crown
- Blend new *level* shoulder into old crown

NOW, for the first time in the history of black top paving, it is possible to lay a level surface over old road and *hold it* level accurately and positively. The new Adnun Liquid Level combined with the direct lift feature of the Adnun Cutter Bar Screed has made this a certainty. The Adnun Liquid Level permits following fluctuations in grade, visually. Mechanical adjustment on the direct lift Cutter Bar Screed permits instantaneous or gradual corrections to hold the bubble in the level at the desired setting for an absolutely level surface.

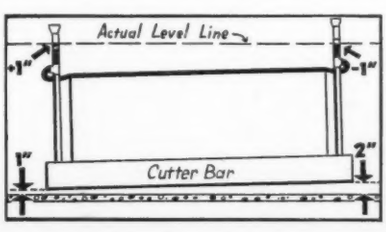
You can bring wavy old roads with reverse slopes to "level". You can build dipping shoulders up to level and blend them into old crown. You can correct, accurately, for any slope at any station.

Only a Black Top Paver with a screed having a straight lift can do this. Adnuns make new roads out of old. They do things other pavers won't do. Remember, the important result is a good road. Ask for details.



Above: Roads of this type are becoming an increasing problem to Highway Departments. They can be leveled with Adnuns.

Below: Diagram of Liquid Level set to lay course 1" at shoulder and 2" at crown. This could be reversed to build up undulating or broken down shoulder.



THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1916 State Street • Nunda, New York

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BLACK TOP PAVER

Water Main Is Laid Across River Bottom

(Continued from preceding page)

the bottom of the Charles, with 50-foot-long sections rising at an angle of approximately 45 degrees at either end to bring the pipeline flush with its trench ashore. After the pipe was laid it was lined with 2 inches of Gunite by the National Gunite Co. of Boston.

This large single line replaces two 36-inch mains, nearly 50 years old, carrying water from Boston to Cambridge. The site of the crossing, west of the Boston University Bridge, is near the Magazine Beach Parkway section of the River. On the Boston side the pipe emerges in the vicinity of Braves Field baseball park. At this point the river has an average depth of 8 feet, but the trench to receive the pipe was dug to a depth of 30 feet below the surface. The deep cut insured 15 feet of backfill as protection for this important water main.

Merritt-Chapman & Scott Photo

Crews lower a 300-foot section of pipeline into a trench 30 feet below the river surface. Five complete turns of each wrench send the pipe an inch deeper.

Trenching and Trestle

Work started on July 15, 1951, from the Cambridge side of the project. This half of the crossing was in place and completed by the end of the year. The same technique was repeated to lay the second half on the Boston side of the river, the job being finished last spring.

Dredging for the river trench was done with a Lorain 80 crane equipped with a 70-foot boom and a 1½-yard clamshell bucket, and mounted on a wooden barge 32 feet wide x 110 feet long. This machine handled the pile driving in the building of the work trestle, as well as the pipe and other material. Bents were set about 12 feet apart in the river and 8 feet apart near the bank, and consisted of two 60-foot lengths of 12-inch 53-pound H-beams driven on 10-foot centers. They were capped with a 12-inch 53-pound member, 18 feet across, and approximately 17 feet above the water.

Driving was done by a McKiernan-Terry 9-B-3 hammer, with air supplied by an Ingersoll-Rand 500-cfm compressor also carried on the barge. Every other bent was cross-braced with 10-inch H-beams, and similar members were also used as diagonal braces along the sides of the trestle. A working platform was then built between the pile bents some 3 feet over the water, and

(Continued on next page)

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In checking over our ever increasing customer list, we find that these contractors buy Viber Vibrators steadily year after year. This repeat business is indicative of the high regard contractors hold for the Viber line.
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running from shore to midriver. Two steel stringers were laid over the tops of the 27 bents to support an upper working platform, built along the downstream side of the trestle.

Welding the Pipe Together

The 34-foot sections of pipe were then skidded out on the lower platform and butt-welded together by two Hobart 300-amp machines carried on the barge. The floating craft maneuvered along the trestle by means of haul lines and a double-drum winch powered by a gas engine. The 300-foot length of welded pipe was blocked up about 10 inches above the platform, and both ends were sealed with watertight bulkheads to prevent flooding when it was lowered.

Carrying slings made of 1¼-inch wire rope were placed around the pipe where it passed between each of the 27 pile bents. The slings were shackled to 2½-inch-diameter threaded steel rods by means of a triangular-shaped connection and a pair of 2-inch clevis pins. The rods screwed down through bearing nuts placed over openings burned through the flanges of the steel bent caps.

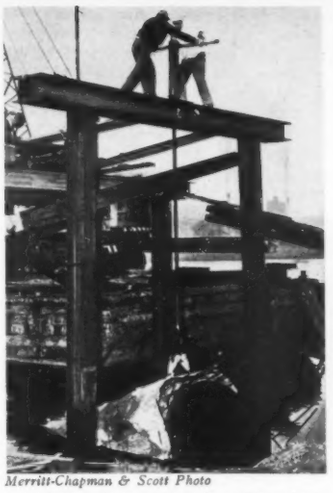
Fabricated by the New England Bolt Co. of Everett, Mass., the rods came in 12 and 14-foot lengths, and were installed in these alternate sizes along the length of the trestle bents. Thirteen of the rods were 12 feet long, and fourteen rods were 14 feet long. The 6-inch-diameter bearing nuts through which they were threaded were mounted on roller bearings, and were fitted with specially designed wing-handled wrenches so that each was turned by two men working on the top platform above the pipe.

The nut was set on an 18-inch-square x 1-inch-thick steel bearing plate. Between the nut and the plate a Timken thrust bearing was inserted to make the turning easier. The 6-inch-diameter vertical portion of the wrench was 30 inches high, and contained wooden inserts to prevent the metal sides from damaging the threads of the rods. The handles of the wrench consisted of 2-inch-diameter pipe, 30 inches long. Sections of 1½-inch bending pipe were inserted in these handles so as to develop more leverage for turning the nuts. The entire device resembled a huge socket wrench.

Concrete Placing

With this well planned layout, the entire 300-foot length of pipeline could be lowered evenly and smoothly in its carrying slings by turning the overhead wrenches. Before lowering, however, octagonal-shaped forms and a webbing of reinforcing steel were built up around the pipe for construction of its 10-inch outer casing of concrete. Not all the concrete was placed in one operation. That would have made the pipe too heavy to handle while it was being lowered the few feet to the surface of the river. To minimize the strain on the carrying slings, only the lower half of the pipeline's casing was poured in the first operation, a total of approximately 130 cubic yards of concrete weighing about 260 tons.

Forms were built of 2 x 6 T & G lumber, held in place with 2 x 4 wales. The Boston Sand & Gravel Co. delivered transit-mix concrete to the shore of the river in a fleet of four truck mixers. It was discharged into bottom-dump buckets which were picked up by the crane and emptied into a hopper set up on the bent closest to shore.



Merritt-Chapman & Scott Photo

A closer view of lowering. Wrenches control the threaded steel rods from which the pipe is suspended.

Rubber-tired buggies carried the concrete from the hopper over the runway platform to the forms. This initial pour, to a level slightly higher than the halfway mark, was made in the early part of September.

After the concrete had set firmly, the over-size wrenches were used to raise the partially concreted pipe several inches until it hung clear of the lower working platform. The platform was then dismantled, along with the lower half of the concrete forms. With two men working each of the 27 wrenches, the entire 300-foot-long section was then carefully and evenly lowered until the concrete-encased lower half rested in the water.

With the buoyancy of the water supporting about one-third of the pipe's weight—then estimated at approximately 350 tons—the contractor poured another 120 cubic yards of concrete for the top half of the casing. This second pour was made near the end of September. Once the concrete had set and

(Continued on next page)

drills **6** *inches of concrete per minute!*

...gives lowest cost per foot of concrete drilled with a TILDEN Rotary Konkrete Kore Drill. Two-thirds more cutting surface make Tilden 70% more efficient. Drills 5 to 7 times more holes without resharpening — even reinforced concrete. Free factory resharpening! Use with any electric or air drill. 29 standard sizes, 3/16" to 4". Interchangeable shanks up to 60".

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TRACLOADERS
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ANGLEFILLERS

C. & E. M. Photo

Superintendent Jesse Comer points to a bearing nut fitted with a specially designed wing-handled wrench.

Water Main Is Laid Across River Bottom

(Continued from preceding page)

the forms were stripped, the big main was ready for lowering into the trench at the bottom of the river.

Lowering the Pipe

Manning their wrenches in unison on top of the upper working platform 17 feet above the Charles, the M-C&S crew lowered the pipeline. The rods were threaded 4½ to the inch, which meant that each five complete turns of the 27 wrenches sent the 300-foot section approximately an inch deeper into the river.

Once the pipe was completely submerged, a halt was called in the lowering operations. By this time the tops of the 13 alternately spaced 12-foot-long rods had passed through their bearing nuts, and were standing clear about a foot below the supporting overhead cross beams. The entire weight of the pipe, more than halved by the buoyancy of the water, was now carried by the alternately spaced 14-foot-long rods. At this point, the tops of the latter rods were almost flush with their bearing nuts. As planned in advance, a system of extension rods had to be installed before the pipeline could be lowered any further.

As a first step, a set of 24-foot-long rods were sent down through the now empty bearing nuts above the 12-foot rods, and were coupled to the latter. After the couplings were completed, lowering operations were continued as before. As the pipe went down, the 14-foot-long rods passed clear of the bearing nuts and were removed, leaving the big main suspended from the 13-footers to which the extensions had been added. Holes had been drilled in the rods for fastening the 10-inch-long screw-type coupling to the two ends with a pair of bolts.

Shore Connections

The lowering of this first half of the pipeline was done in the early part of October and extended over a couple of days as the sinking was handled with great care. The pipeline, which was estimated to weigh 2,700 pounds per linear foot in the air, weighed about one-third of that figure in the water. Just above the river bottom the lowering was halted, and the bottom of the trench was cleaned off with an air lift to insure an even bearing for the main. The air lift consisted of a 40-foot length of 12-inch-diameter pipe carrying a 1-inch air line from the compressor on the barge. The compressed air forced the loose mud from the bottom up through the big pipe. Then the lowering was resumed until the pipe was at the bottom of the trench, 30 feet below the surface.

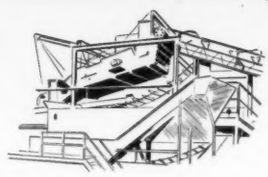
Divers made an underwater examination to see that the main was evenly seated. They next unshackled the remaining rods from their carrying slings, and burned off the portions of the slings that were not embedded in the concrete.

A cofferdam was constructed on the Cambridge bank around the shore side of the now submerged pipeline, and its interior unwatered. This permitted the contractor to work "in the dry" when adding the last 34-foot-long riser section which brought the pipeline up to the level of the 8-foot trench in which it is buried ashore.

The Boston side of the project was completed early this year. In the final operations, divers joined the two halves of the pipeline at midriver, and a concrete casing was poured under water to seal the joint. The trench was backfilled with select material. Watertight bulkheads at the midriver and shoreside ends of each of the two sections were burned out later from inside the pipe, and the Gunite lining was installed.

(Concluded on next page)

for reliable performance...



Torrington Spherical Roller Bearings compensate for shaft deflection and housing distortion caused by shock loads. Binding stresses are eliminated—efficient operation assured.

Already used as original equipment on construction machinery of virtually every type, these rugged bearings are becoming more and more popular for all service needs.

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Traffic rolls smoothly

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FLEXCELL* JOINT FILLER keeps joints smooth, tight, maintenance-free!

San Francisco—Oakland Bay Bridge
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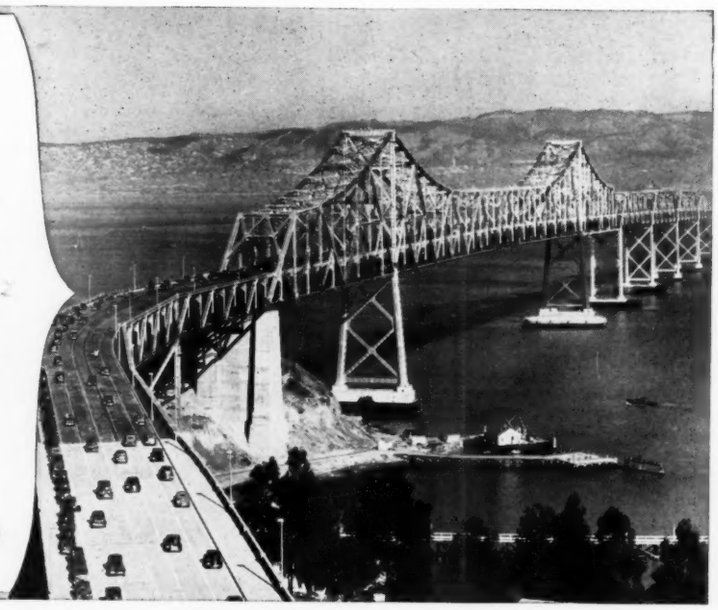

ONE WAY TO BE SURE of tight, smooth, neat joints wherever concrete meets concrete is to specify Flexcell Bituminous Fibre Expansion Joint Filler. It's resilient, non-extruding, remarkably durable!

MILLIONS OF TINY air cells in the cane fibre base of Flexcell permit it to absorb pressure from expanding concrete without extruding—spring back to keep the joint closed when concrete contracts. This prevents bulges and bumps, does away with gaping crevices.

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THESE ARE THE REASONS why Flexcell Joint Filler has long been specified by leading engineers, contractors and architects, as well as the U. S. Army, Navy and many other Federal, State and Municipal agencies.

SO BEFORE YOU BEGIN another job, investigate the advantages and economies of using Flexcell Joint Filler—for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. You'll be glad you did! Mail coupon today for full data.

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The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fibre Expansion Joint Filler marketed by The Celotex Corporation.

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Without obligation, please send me complete specifications and prices on Flexcell Bituminous Fibre Expansion Joint Filler.

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Personnel

The Boston water-main project was handled by Merritt-Chapman & Scott's New England Division, headed by Alfred M. Heaton, Resident Vice President. Charles Richardson was Project Manager on the job, and Jesse Comer was Superintendent. The work force averaged 10 in number except during the lowering operations, when more men were added to handle the big wrenches.

Stewart Associates of Cambridge, Mass., was consultant on the project, with A. L. Guild serving as Resident Engineer.

Charles O. Clark, Associate Engineer under Harold Toole, Chief Engineer, was the representative for the Water Division of the Metropolitan District Commission, which is headed by Edgar F. Copell, Director and Chief Engineer.

IRF Re-Elects Magennis

At a two-day meeting of the International Road Federation in Washington, D. C., last May, Frank T. Magennis, a vice president of The Goodyear Tire & Rubber Export Co., Akron, Ohio, was re-elected Chairman of the Board. Representatives of 26 of the 38 countries affiliated with IRF attended the meeting, and Mr. Magennis, in an address after his re-election, spoke of the added impetus to road building apparent last year in foreign lands. He cited the case of Mexico which, to develop its feeder-road system, has in the past two years built about 3,000 miles of new thoroughfares.

IRF, which was founded in 1948 by businessmen, is a service organization to encourage the development and improvement of highways. Some of its functions are: to assist national road associations in promoting a road-conscious public and government and foster new road groups; to collect statistics on the benefits accruing from good roads and support advance training in highway engineering; and to act as consultant to the United Nations. The Federation maintains headquarters in London and Paris as well as Washington, D. C., and last year it became a member of the Highway Research Board and the National Academy of Sciences of the United States.

Up-to-date road networks in countries abroad would raise the standard of living in those countries, said Mr. Magennis, as they did in the United States after World War I. Adequate thoroughfares must be built to reach unused natural resources and to open new agricultural areas to farming. "A global road-improvement movement will be a giant stride forward in extending cultural and economic benefits of the modern age", he concluded.

Data on Anti-Rust Paints

A new bulletin containing information on the selection and use of anti-rust paints for all metal surfaces is announced by Paint Corp. of America, Fidelity Bldg., Cleveland 14, Ohio. It describes the chemical properties of anti-rust paints and discusses the various methods of application. It also explains how and when to use colored finish paints over anti-rust paints.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 326.

Waterproof Paper Helps Halt Floods

When the Missouri River went on the rampage last spring, engineers saved Kansas City by strengthening the existing levees. A method they used involved erecting flashboard fences 6 feet high on top of the levees and piling sandbags on the river side. On the land side in several places, Sisalkraft paper was fastened to the flashboards, after which bulldozers shoved dirt against the waterproof paper. Sandwiched between the flashboard fence and the dirt, its function was to prevent weakening of the dirt embankments due to water seeping through the flashboards.

Kansas City engineers are leaving the fences intact through the whole of this month. July is a danger month for high water, and they are not taking any chances.

Sisalkraft waterproof building paper helped protect Kansas City from the Missouri floods. It prevented water from seeping through the flashboards built on top of the levees and weakening the dirt embankments.

STANOLUBE HD-M
REG. U. S. PAT. OFF.
Motor Oil

a new, tougher oil for tougher jobs!

● Since the introduction of STANOLUBE HD Motor Oil in 1942, Standard has led the way in the development of additive-containing lubricants for automotive and diesel engines. New STANOLUBE HD-M is tailored to meet the demands of today's increased severity of operating conditions. It's a tougher oil for tougher jobs! Here's what it offers to operators of heavy-duty equipment:

Longer engine life results from STANOLUBE HD-M's improved detergent-dispersant action. Engines stay clean under the tougher operating conditions caused by adverse fuel quality, higher running temperatures, and prolonged periods of severe service. Freedom from deposits means less engine wear. Less engine wear means longer engine life.

Lower maintenance costs result from STANOLUBE HD-M's greater oxidation stability. It helps keep pistons, rings, and valve stems free from varnish-like deposits and provides protective films of oil in the face of high operating temperatures. Less wear on engine parts and longer periods between overhauls mean lower maintenance costs.

Your nearby Standard Oil service-supply center stocks STANOLUBE HD-M Motor Oil for fast *local* delivery. This service-supply center is also headquarters for your Standard Oil lubrication specialist. Call him today. He can help you obtain maximum lubrication benefits with STANOLUBE HD-M . . . a tougher oil for tougher jobs! Or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY *(Indiana)*

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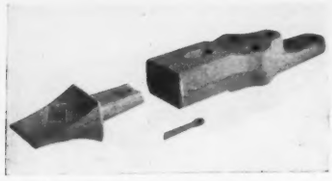


The new Blaw-Knox reversible and replaceable cutter for clamshell buckets. The base is permanently attached to the scoop or lip; the renewable tip wedges into the base.

Replaceable Cutter For Clam Buckets

A reversible and replaceable cutter for clamshell buckets is announced by the Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa. It replaces the old-type one-piece tooth presently used.

Similar in principle to the two-part tooth used in draglines and trenchers, the new tooth consists of a base which is permanently attached to the scoop, or lip, in the usual manner, and a reversible and renewable tip which fits into a slot and wedges itself into the base. The unit reduces costly shutdown time by requiring only the replacement of that portion of the tooth which wears out.

Bases and cutters are available from stock for many Blaw-Knox buckets now in use and, in addition, blank bases (without drilling) can be applied to bucket sizes where the bolt-hole patterns come within a range of the base outline. The adaptability to existing buckets can readily be determined by the factory from the serial number of the bucket.

Further information may be secured from the company by requesting Bulletin 2399. Or use the Request Card at page 16. Circle No. 298.

Electronic Gluing Unit

A portable high-frequency electric gluing unit that "spot welds" plywood wall panels in place has been developed. It permits the use of ¼-inch plywood paneling and completely eliminates the use of exposed surface nails. The glue sets almost immediately, the company claims; the method assures flush joints and cannot be distinguished from a custom job.

In the conventional system of erecting plywood paneling, nails or brads hold the panels in place while the glue sets. But with this gluing unit, the "spot welds" take the place of nails while glue in the intervening areas sets naturally. The company recommends that "welds" be applied wherever a nail or brad would customarily be used.

An alternative method is to nail plywood sheathing to the studs and "spot weld" the ¼-inch hardwood plywood to the sheathing. In this method, the entire back of the hardwood plywood is coated with glue and the high-frequency unit is used to apply the welds. Conventional plastic resin glues are used.

Further information may be secured from United States Plywood Corp., Weldwood Bldg., 55 W. 44th St., New York 18, N. Y. Or use the Request Card at page 16. Circle No. 308.

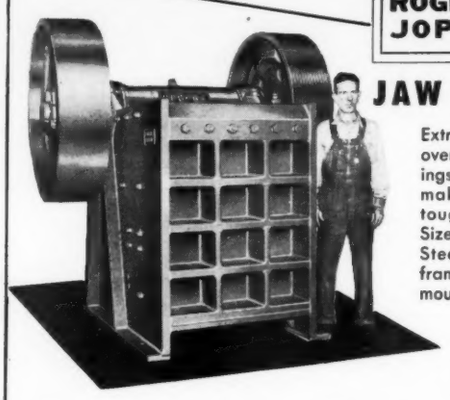
Using the Wood Welder portable high-frequency electric gluing unit, a workman "spot welds" plywood wall paneling in place in a matter of minutes.

Spex for Wood Treatment

Specifications on the use of pentachlorophenol to protect wood against rot and insects are available from The Dow Chemical Co., Midland, Mich. They give the treatment and method recommended for wood piles, service-line poles, cross and switch ties, structural lumber, millwork, and general lumber. They also list 6 wood-treatment preservatives and their characteristics.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 286.

ROGERS JOPLIN



JAW CRUSHERS

Extra long crushing jaws, oversize shafts and bearings, rugged construction make light work of the toughest crushing jobs. Sizes up to 32 x 40 inches. Steelweld or cast steel frames. Stationary, skid-mounted or portable. For high production, continuous operation and low maintenance, you can depend on ROGERS.

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Joplin, Missouri

SPEED UP THE JOB . . .
BUILD UP YOUR PROFITS

with

Firestone
TIRES

WHETHER you make or lose money on many jobs depends on tire performance . . . in rugged rock work, strip mining or heavy earth moving, you need tires specially designed and engineered to withstand torturous abuse.

Regardless of how big or how tough the job, Firestone has a tire that will meet your particular requirement. *You get more for your money with Firestone tires because there is more built into them.* The cut-resistant treads are extra thick and extra tough. The Gum-Dipped rayon cord bodies are reinforced with four extra impact plies. Sidewalls are double-thick, cut and snag-resistant. You get a Lifetime Guarantee with every tire.

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America's future depends upon more and safer highways

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Michigan Permits Half-Year License Plates for Trucks

To the Editors,
CONTRACTORS AND ENGINEERS MONTHLY:

The article "Taxing the Dump Truck" in your May issue was of considerable interest to me, but, I am sorry to say, not especially constructive . . . House Bill No. 347 was introduced last February 8. Indications were that there was no applicable opposition to this bill and it was passed, given immediate effect, and presented to the Governor for signature on April 15. . . .

As a result of this legislation, it is now permissible in Michigan to purchase a half-year license plate for a truck, effective from September 1 until the last day of February of the following year. Also, any truck for which the registration fee equals or exceeds $50, a registration plate must be purchased, effective from May 15 through November 14, or November 15 through May 14 of the following year. This gives a truck operator in Michigan the privilege of the selection of any of the three periods of the year for partial registration.

The fee effective from September 1 through February is one-half the full-year registration. The fee for the other two periods is one-half the full-year registration plus $2 each for the special handling.

The last column of your article reads: "With a 26,000-pound limit on dual axles," etc. Inasmuch as you have singled out the state of Michigan for comparison with other states of the Union, we wish to advise as far as Michigan is concerned it should have read: "With a 32,000-pound limit on dual axles on Class A highways," etc.

We believe that Michigan has been one of the leading states in the nation so far as constructive highway legislation is concerned. It seems that you might have named the states that you felt were discriminating against the contractors rather than singling out the state of Michigan which, we feel, has cooperated very well not only with the contractors but with the trucking industry as a whole.

Very truly yours,
G. M. Foster,
Chief Deputy Commissioner,
Michigan State Highway Department,
Lansing, Michigan

Front-End Trencher

A trenching unit for use with the Hough HM Payloader is announced by Whitestown Trencher Co., Wood Road, Whitesboro, N.Y. It digs 8 feet deep, dumps 10 feet high, and has a 26-inch self-cleaning bucket with a ½-yard capacity. The bucket can also be equipped with teeth.

The trencher is installed by removing the Payloader's bucket and attaching with the same pins. The company points out that the operator has a clear view of the work.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 398.

A trencher for the Hough HM Payloader—it attaches with the same pins used to attach the bucket.

A Road Sweeper

A general-purpose sweeper used with the International Cub tractor is in production at Meili-Blumberg Corp., New Holstein, Wis. The brush is hydraulically raised and lowered, and is rotated from the rear power takeoff. All shafts turn on self-aligning ball bearings and are fully shielded for safety. A tubular frame runs under the tractor, with an adjustment provided to compensate for road contour and wear of the brush. The dust hood may be easily removed for snow sweeping.

The brush is 25 inches in diameter and 72 inches long, providing a 60-inch sweeping path. It uses Palmyra stalk and can be refilled.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 305.

This Meili-Blumberg sweeper is specially designed for use with the International Cub tractor.

Manufacture Extended To Midwest by Willard

Willard Concrete Machinery Sales Co., Lynwood, Calif., has made arrangements for Willard truck mixers and weigh-batch loaders to be made also by Hercules Steel Products Co., Galion, Ohio. The new arrangement, in providing centrally located manufacturing facilities, will give Willard customers in the eastern states better and cheaper delivery service.

CHRYSLER INDUSTRIAL

offers Greater Power, More Efficiency!

Here's why . . . The great new Chrysler V-8 Industrial Engine is completely new in V-8 design. This engine embodies more desirable characteristics than ever before offered to Industrial engine users.

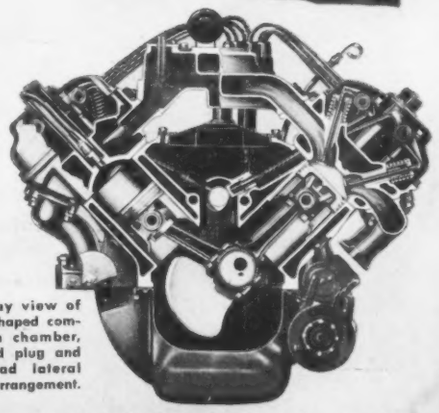
Hemispherical Combustion Chamber provides 33 per cent more horsepower, 16 per cent higher torque. It increases displacement only 3.2 per cent,* yet develops more power for displacement than any comparable engine in Industrial use. *It is today's most nearly perfect combustion chamber!* It allowed many desirable changes in V-8 design—most important of which are larger and wider spaced valves and "free-flow" intake and exhaust porting.

Centered Spark Plugs provide shorter flame travel through fuel. You get greater power from the same amount of fuel; easier, faster starting, *plus* less carbon deposit in the chamber, adding years to engine life.

Overhead Lateral Valves are larger, wider spaced. They operate cooler, eliminating preignition. This ingenious valve arrangement permits gravity flow of the fuel and air mixture into intake and out of exhaust ports—practically eliminates back pressure.

More Efficient Cooling is due to less heat rejection in the combustion chamber. More heat is turned to power. More coolant flows around valves and bore. Water jacket completely surrounds cylinder. With *less coolant* this new engine *has better cooling* —a more compact, efficient, over-all cooling system!

These are only a few of the important developments made in Chrysler Industrial V-8's. There are many more. *These* engines will give you a whole new conception of Industrial power. Ask a Chrysler Industrial Engine Dealer to explain their advantages on your jobs, or write us direct for full information. **Marine and Industrial Engine Division, Chrysler Corporation, 12200 E. Jefferson Ave., Detroit 31, Michigan.** *Model IND-40



Cutaway view of dome-shaped combustion chamber, centered plug and overhead lateral valve arrangement.

CHRYSLER Industrial Engines

Prestressed Bridge Is Tested to Failure

A prestressed-concrete footbridge built for the Festival of Britain was tested to destruction last spring. Two London concrete-manufacturing groups, the Cement & Concrete Association and the Prestressed Concrete Development Group, carried out a three-day test of strength on the slender 284-foot-long bridge. Failure occurred at just about the load expected by the designers—85 long tons—which is 143 per cent more than the design load of 35 tons.

The experts selected a 76-foot end span for the test, and on this span successively heavy loads of pig-iron ingots were placed. Cracks began to appear in the concrete under the deck, and deflection gages registered the sagging of the platform. At about 81 tons the whole structure shuddered, and the next 3½-ton ingot brought down the span, splitting it into four parts and dragging a 17-foot-high supporting column with it.

British Information Services Photo

In a test to destruction, a span of the prestressed-concrete footbridge on London's South Bank Festival site collapses under an 85-ton load of pig-iron ingots. Experts gained valuable information.

As well as confirming the expected failure point, the test established that no unnecessary material was used in the construction of the footbridge.

Ratchet-Type Pulling Tool

A device that pulls or lifts a chain in any position is described in a bulletin issued by Chisholm-Moore Hoist Corp., Fremont Ave., Tonawanda, N. Y. The portable lightweight Model B puller is made of aluminum-alloy castings and operates by a ratchet handle. The top swivel hook is attached to some stationary object and a chain is hooked to the unit being pulled. With the load in place, the handle is moved up and down, pulling the chain and the load. Models are made with ¾, 1½, 3, and 6-ton capacities.

This literature may be obtained from the company by requesting Bulletin 146-C, or by using the Request Card which is bound in at page 16. Circle No. 312.

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Pioneer of the Modern Trencher

Right on grade on a rush job.

Smooth, clean trench—on schedule.

Truck loading came in handy here.

More than a quarter century of efficient performance in all types of trenching work has earned for CLEVELANDS their reputation for producing *more trench in more places at less cost.*

LOOK AT THESE FEATURES

- Wide variety of speed and power *combinations* provides the *right* combination for every job.
- Compact, maneuverable—fits more jobs in congested or open areas.
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- Proved design and materials—less weight—more work—longer life.
- Unit type construction—simplifies servicing.

For complete information on CLEVELAND TRENCHERS see your local distributor or write for Bul. S-111.

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THE CLEVELAND TRENCHER CO.

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Simplify Set-Up in

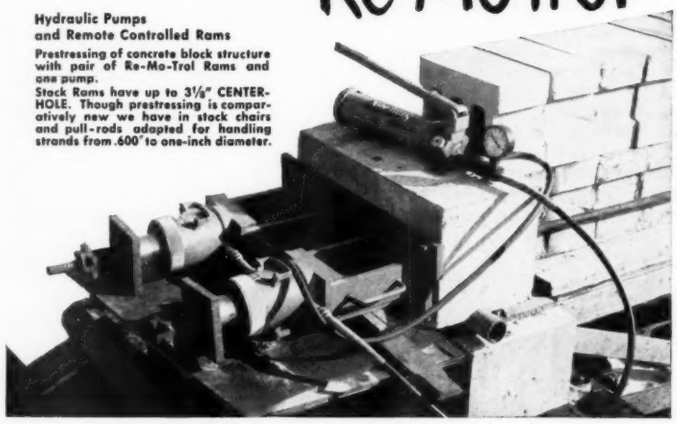
PRESTRESSING CONCRETE

with SIMPLEX Re-Mo-Trol

Hydraulic Pumps and Remote Controlled Rams

Prestressing of concrete block structure with pair of Re-Mo-Trol Rams and one pump.

Stock Rams have up to 3⅛" CENTER-HOLE. Though prestressing is comparatively new we have in stock chairs and pull-rods adapted for handling strands from .600" to one-inch diameter.



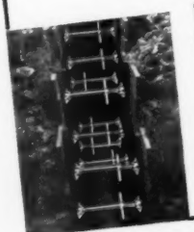
The Simplex Re-Mo-Trol with the Center-Hole Ram eliminates need for complicated rigging in prestressing of concrete—saves time, cuts costs. Single rods or strands pass through the Center-Hole Ram for fast set-up and smooth, even operation. Double-strand pulls are made with two Rams operated from a single pump . . . no need for heavy, clumsy yokes. Pressure gauge on pump gives accurate stress control. Two Pumps with solid or center hole rams are available in models 10 to 100 ton capacities.

SIMPLEX JACKS...

Speedy . . . Safe . . . Versatile . . . for All Construction Operations

SIMPLEX Ratchet Lowering Lever Jacks

Safe . . . Efficient . . . Rugged. Lift full capacity on cap or toe. Available in capacities of from 5 to 35 tons.



SIMPLEX Trench Braces

Protect Against Cave-ins. Steel drop forgings, with ball and socket joints at ends for quick adjustment and tight grip. Adjustable to any width trench. Available with or without pipe.

Simplex LEVER • SCREW • HYDRAULIC Jacks

Write for General Catalog No. 50 for full information . . . today.

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County Road Society Affords United Action

Well Managed Michigan Association Provides Expert Counsel, Trains Personnel, and Maintains State Contact

• THE benefits to be derived from a well organized and well managed county road association were described at the 38th Annual Purdue Road School in Lafayette, Ind. J. T. Sharpensteen, Highway Engineer of Genesee County, in Michigan, told how the county road association in that state provides expert counsel, collects and distributes latest information, trains personnel, and maintains representation at the state capital.

The association, he said, was set up "to promote higher efficiency in the operation of the county road system of Michigan and to provide and furnish to member county road commissions, at cost, consultant service and advice on all phases of county road activities in order to promote such efficiency". It has functioned since 1918 and has not only brought the road commissions together but also created a cordial relationship with other highway agencies. The organization has fostered a spirit of cooperation so that individual counties no longer "try to go it alone in matters that are of concern to all".

Organization

The association is a quasi-official entity of government, having legal status as a service organization for the road commissions. It is owned and operated, through a board of directors, by the 83 county road commissions of the state. The eleven directors are elected annually by written ballot; they, in turn, elect their own officers: a president, vice president, and secretary-treasurer. They also employ an engineer-director, who is a registered professional engineer, as the chief executive. He is in charge of the estate office at Lansing, and carries on the business of the association under the policies established by the board of directors.

The staff of the association is not large, because most of the technical work is done by a series of unpaid committees appointed annually by the president. These committees cover such fields as accounting, administration, airports, auditing, engineering, equipment rental, public relations, and standards and specifications. They are called to the Lansing office either by the committee chairman or the engineer-director. Decisions reached are transmitted by bulletins to the various county road commissions. If the subject matter seems to be controversial, a report is made and reasons for the conclusions are discussed at one of the four annual meetings. Open discussion is welcomed and, after such hearings, the conclusions reached are adopted and later transmitted by bulletin to the county road commissions for their guidance. By following this method, cooperative uniform procedures have been obtained on most phases of county road operation—among them, uniform accounting practices which have now gained national recognition.

Services

Michigan law provides that a county road commission shall employ a competent highway engineer and may engage such other professional and consultant services as it deems necessary to carry out the requirements of law and to promote efficiency and economy in the operation of the county road system. Most road commissions employ a full-time, resident, registered professional engineer. But it is not possible for him or the superintendent to keep up with all the problems confronting a road commission. That is where the association comes in. Instead of each county having to build up adequate personnel to cope with all such problems, the association provides the required consulting service and advice. Having a central source to consult on engineering, legal, and personnel problems is far less expensive, said Mr. Sharpensteen, than duplicating the service in each county.

Expert counsel and advice are given on construction, maintenance, equipment rental, engineering standards, Federal and state regulations and priorities, purchasing practices, sources of materials, personnel matters, and general administrative procedures. Also, bulletins are compiled and employees are instructed in these matters.

Financing

Apportioning the cost of the association's service among the 83 county road commissions is done by a classification method based on the amount of state-collected revenue each road commission receives. There are 8 classifications, with the largest number of road commissions falling into the class with the lowest service charge. The low-income counties fall into this classification, and their service charge is $300 per year, while counties having higher incomes

(Concluded on next page)

Do your sealcoating and ice control jobs the fast easy Swenson way. Spreads salt, chloride, sand or cinders any width or amount desired.

Free Information

Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

TEAMED UP FOR TOP PERFORMANCE

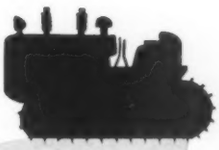
IH TD-24 Tractors and matched BUCYRUS ERIE Equipment

BUCYRUS-ERIE equipment for the International TD-24 was engineered expressly for use with this modern tractor. Each unit has the size, weight, capacity and balance to work effectively with the TD-24 — to apply fully its exceptional power.

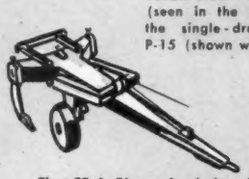
Let your International Industrial Tractor Distributor give you complete information on the wide range of Bucyrus-Erie equipment available for the TD-24.

BUCYRUS-ERIE CO., South Milwaukee, Wisconsin

10T52



Two Power Control Winches: The double-drum rear-mounted P-29 (seen in the scraper view) and the single-drum front-mounted P-15 (shown with the Bullgrader).



Choice of Three TD-24 Blades: The Bullgrader (shown) features three blade positions plus vertical tilt. The Bulldozer has straight across blade position, The Tilting Bulldozer has straight across blade with vertical tilt.

The CR-4 Ripper is designed to withstand the power of two TD-24's — one pulling and one pushing.

Four Pusher Plates: One mounts directly on Tractor frame (shown here). Others mount on Bullgrader frame, Bullgrader blade or Bulldozer blade.

The BIG RED TEAM

Two Big-Capacity Scrapers work with the TD-24: The B-170A with 16-yd. struck capacity is the biggest of scrapers for loading without pusher help. The 22-yd. (struck) B-250 is the largest scraper in current production.

See Your International Industrial Tractor Distributor

County Road Society Affords United Action

(Continued from preceding page)

pay a proportionately higher service charge. All counties are entitled to equal service regardless of the amount they pay. The board of directors establishes the budget each year, after which the association sends statements to the county road commissions, in accordance with the classification. No further charge is made in that year, although it is possible to handle any matters of emergency finance by a special charge.

One of the association's newer services is a monthly magazine called "Highways and Byways". Every road commission receives forty copies per month as part of the annual service. Copies greater than that number are ordered by the individual road commissions and are paid for at cost. The monthly run is 8,000 to 10,000 copies. Most of the distribution is made by the road commissions to their employees, local citizens, supervisors, etc. The balance of the distribution is handled from Lansing, going to members of the Legislature, state officers, contractors, equipment and supply houses, etc.

Each issue contains at least one technical article, usually prepared by one of the county engineers, news from the various employee groups, and other articles of general interest. Although numerous requests for advertising space have been received, no advertising is carried in this magazine.

Sponsors Legislation

In 1946 the County Road Association of Michigan took an active part with other members of the Michigan Good Roads Federation in a survey to determine the amount of money needed to put all the highways and streets in the state in a tolerable condition. A definite legislative program resulted. With its large collection of highway statistics, the association was able to advise the Legislature and furnish reliable information on highway matters that was not attainable from any other source without long delay.

The Legislature raised the gasoline tax to 4½ cents, an increase of 1½ cents a gallon. At the same time the registration fees on trucks were increased $5,000,000. In all, highway revenues have increased from a total of $86,500,000 in 1950 to an estimated total of $130,000,000 in 1952. The county road commissions will benefit to the extent of 37 per cent of the over-all increase.

Along with the increase of highway funds, laws were enacted providing for improved administration, classification of roads, and better accounting, and requiring that each county employ a registered professional engineer. If a county fails to employ such an engineer, it forfeits a part of its income. All these measures had the endorsement of the County Road Association.

In his summary, Mr. Sharpensteen pointed out again that while adequate financing is important, a properly managed association can bring other benefits to its members. Expert advice and counsel on problems arising in a county road organization can be made available. The latest information on phases of highway operation can be collected and compiled and distributed to the membership. County road employees can be given more training to increase their efficiency. And with the association's representation, member counties can save the time and money of traveling to and from the state capital.

Small Roller Models

Two power rollers for landscape and small-scale paving work have been introduced by Consolidated Industries, Inc., West Cheshire, Conn. The weight of the lawn model can be adjusted between 300 and 1,200 pounds, and the general model varies between 375 and 1,400 pounds. The latter carries a 15-gallon sprinkler tank. Both units can be carried in a pickup truck or station wagon.

Weights of the two Con-Sol roller models can be varied from 300 to 1,200 pounds and 375 to 1,400 pounds.

Powered by a 2½-hp Briggs & Stratton engine, the Con-Sol units feature grouped controls on the handle bar, a tiller-type steering bar, and a single lever for both forward and reverse.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 304.

Motorola on West Coast

Motorola, Inc., Chicago, Ill., opened a new west-coast Parts and Service Department on June 1 at 811 South B St., San Mateo, Calif. John Jipp, formerly Sales Manager of Motorola's Communications and Electronics Division (southwestern region), is in charge of it. He has been with the company since 1945. The San Mateo office, which serves nine western states, is completely equipped to handle parts and service on two-way radio installations, microwave systems, power-line carrier equipment, telemetering equipment, and remote-supervisory-control installations.

Mr. Jipp's successor as Regional Manager for the division's southwest sales area is Ed Falls, a former Zone Manager for the southern California area. Mr. Falls, who had had nine years' experience with Motorola before his naval service during World War II, rejoined the company in 1948.

Southern Superintendent Says

"We load quicker, haul faster and Move More Dirt!"

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

Heavy-Duty Bulldozer

A heavy-duty hydraulic bulldozer that fits most crawler tractors is made by Teale & Co., P. O. Box 308, Omaha 2, Nebr. The blade of the Duncan dozer is 30 inches high, 6 to 8 feet wide, ⅜ inch thick, and has a 6-inch reversible steel cutting edge. It can be raised as far as 48 inches above ground level to prevent dragging when going through ditches and to increase leverage when pushing over trees. For deep cutting, the blade can go down 12 inches below the level of the tracks.

The large hydraulic oil tank with a 2-way control valve is mounted on the right side directly under the operator's hand. The cylinders are 4 inches OD, with a 1⅜-inch chromium-plated shaft.

The heavy-duty hydraulic Duncan bulldozer fits almost all crawler tractors. It can be raised 48 inches above ground level and dropped 12 inches below track level.

Front or rear-mounted pumps are available. All hose is reinforced with wire braid.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 271.

Bros Advances Williamson

A. O. Williamson is newly appointed Manager of the Road Machinery Division of Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn. The appointment is part of the company's reorganization into three main divisions: Road Machinery, Steam Power, and Special Fabrication.

Mr. Williamson joined Bros in 1933, when the Road Machinery Division was formed. He has served in this division as Sales Engineer and General Product Engineer.

Atlanta airport expansion job is scene of new triumph for International power

When C. A. A. district headquarters decided to move to Atlanta, Georgia, the east-west runway at nearby Fulton County Airport had to be extended to 5,000-foot length.

One contractor, C. L. Rhodes of Decatur, Georgia, is doing the entire job, including cutting through a 39-foot hill and moving 350,000 cubic yards of sandy clay.

Rhodes' General Superintendent, R. N. Smith, tells how the work is going:

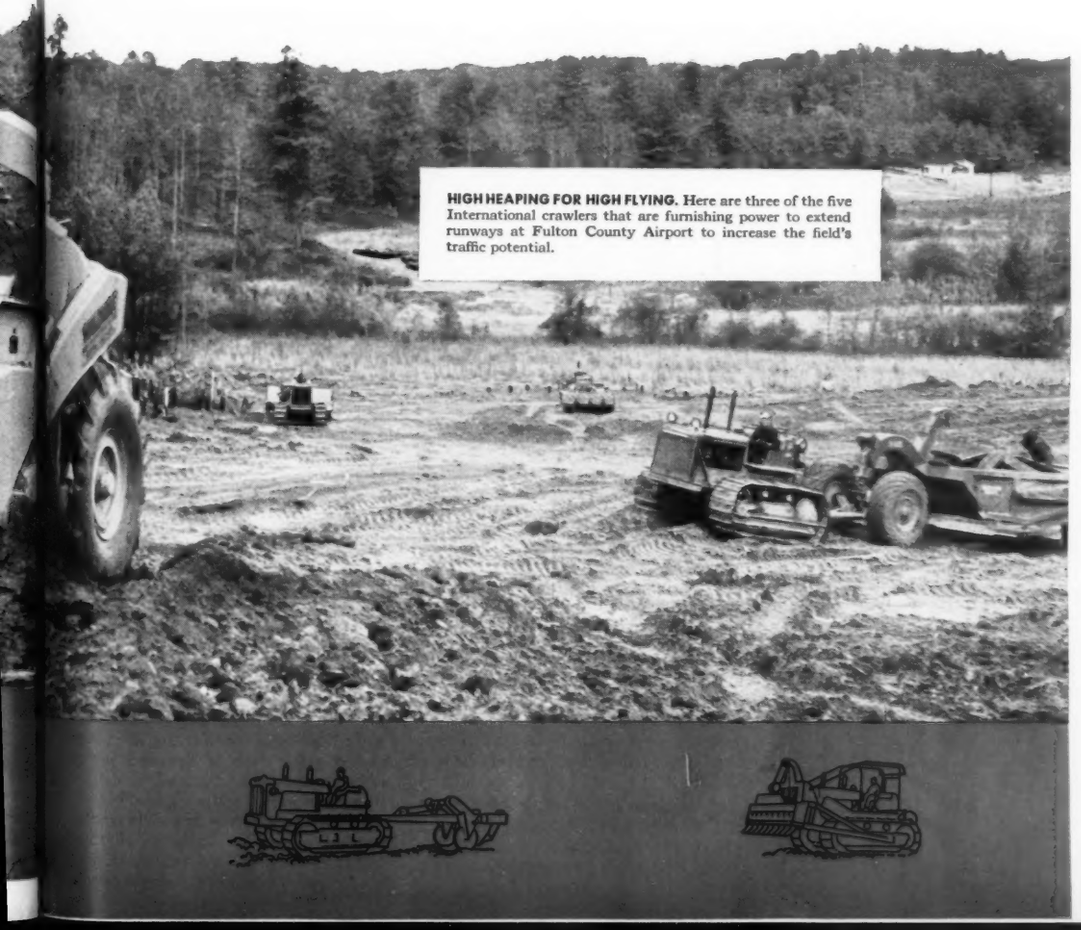
"We load quicker, haul faster and move more dirt with our Internationals than with any other crawlers.

"Our operators push 'em to the limit all day long to get the job done ahead of schedule. The tractors get clean filters, fuel and grease, and hard work—more hard work than is reasonable—and they take it month after month without a let down!"

That's what International owners everywhere are finding out. Find out for yourself. Ask your International Industrial Distributor for details.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

JOHNNY-ON-THE-SPOT SERVICE. A fast field service team from International's Atlanta distributor rolls up to the job site. Service like this from *your* International distributor is as near as your nearest telephone, to cut down downtime and keep your equipment rolling!



HIGH HEAPING FOR HIGH FLYING. Here are three of the five International crawlers that are furnishing power to extend runways at Fulton County Airport to increase the field's traffic potential.

Seabee Veterans' August Convention

The Seabee Veterans of America is to hold its 6th Annual National Convention in Milwaukee, Wis., on August 21 through 24. National Convention Chairman is Clay Fralick, of Clay Fralick, Inc., 815 W. Wisconsin Ave., Milwaukee. Convention headquarters are at that address, but will be moved to the Schroeder Hotel during the Convention.

The Navy's famous Construction Battalions (C. B.'s) were organized soon after the outbreak of World War II to fill the urgent need for construction men to build advance bases in forward areas, and they eventually reached a strength of 400,000. The elite of the Navy's Civil Engineering Corps, the Seabees built harbors, docks, airfields, hospitals, roads, camps, supply depots, ship-repair stations, submarine bases, and anything else that was needed for the armed forces' fight northward through the Pacific. Alaska, Africa, Sicily, Italy, France, Belgium, and Germany, too, all saw the Seabees at work, and their reputation in these places is high. After the war, the Navy maintained only a token force, but since Korea new groups have been formed which are now serving from Point Barrow to Casablanca.

The Seabee Veterans of America, one of the youngest veterans' groups, is not connected with the U. S. Navy any more than other veterans' groups. Started by Howard P. Potter, construction engineer, of Kohler, Wis., in early post-war days, the organization is strictly a Seabee alumnus group, and many veterans of other corps and services who were under the Seabee command are also members. Doctors, dentists, hospital corpsmen, supply officers, disbursing officers, and chaplains come into this category. The present President is John L. Guminski, Chicago, Ill.; Vice President is J. Bert Knille, Cincinnati, Ohio; Secretary, Willard E. Zonsius, Chicago; Treasurer, James J. Johnson, Chicago. Rev. Francis E. Wallace, La Crosse, Wis., is Chaplain.

The Convention, which will center around the Hotel Schroeder, will comprise business meetings, brewery visits, parties, tours, dances, rumpus-room gatherings, and a large banquet and dance on Saturday, August 23. Some top speakers will be: Admiral J. F. Jelley, Chief of the Civil Engineers; Admiral Ben Moreell, retired, under whose leadership the Seabees were formed; Governor Kohler; and Mayor Zeidler.

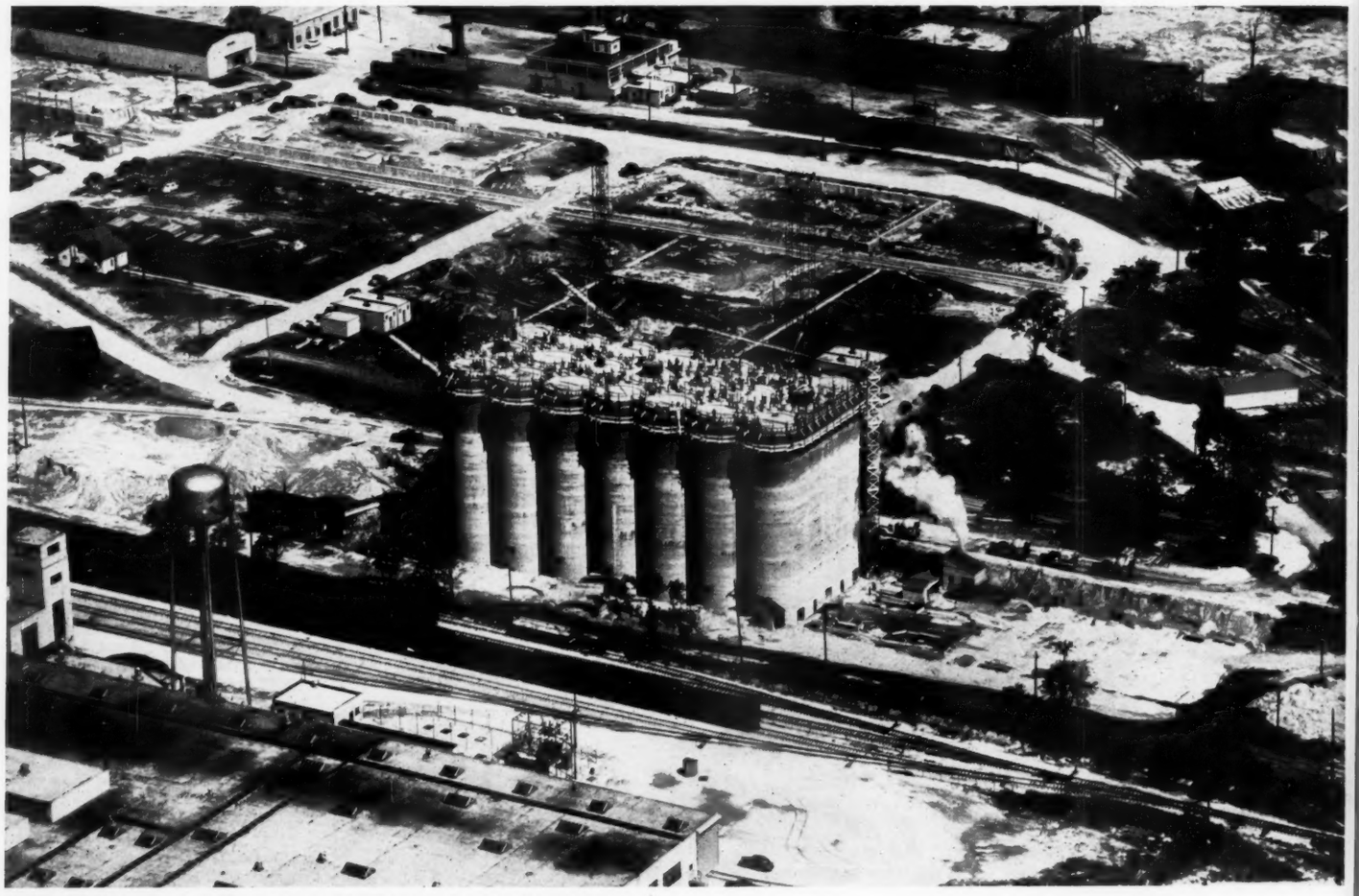
W. S. Tower Retires From Steel Institute Presidency

Walter S. Tower, President of American Iron and Steel Institute, New York, N. Y., for the past 12 years, retired last May. He will continue to render advisory and consulting services to the Institute.

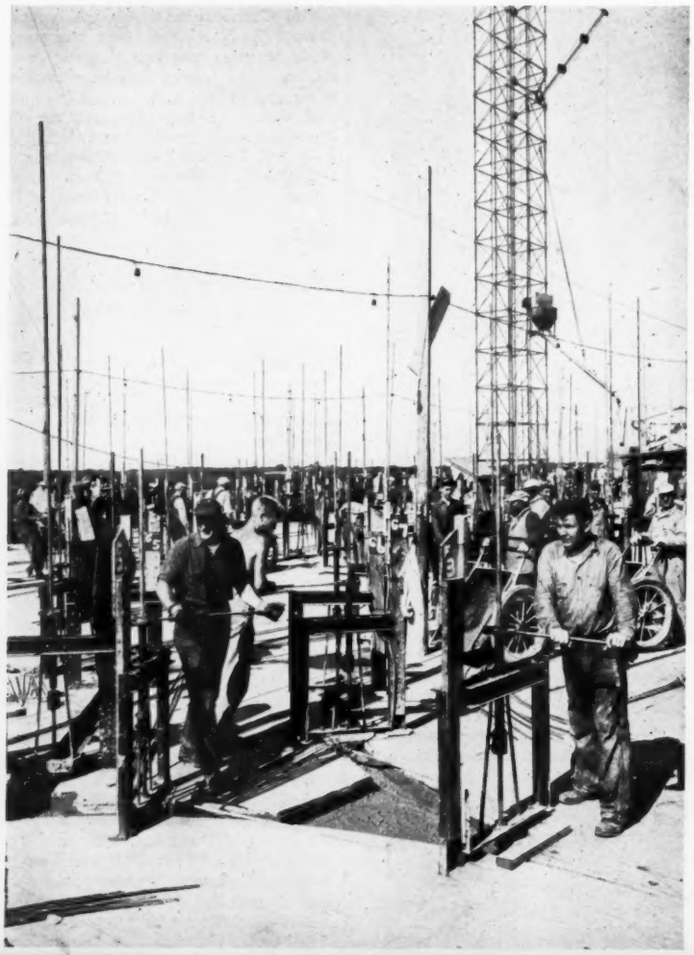
At the dinner meeting of the Institute in New York on May 22, Mr. Tower received the Gary Memorial Medal. This medal, in honor of Elbert H. Gary, founder and first President of the Institute, is for outstanding achievement in the industry. Since its establishment in 1927 it has been previously awarded to only ten men.

The Directors have not elected a new President, but other elections were as follows: Max D. Howell, Vice President and Treasurer of United States Steel Corp., takes over the newly created post of Executive Director, as well as being re-elected Treasurer. Re-elections include: B. F. Fairless, Chairman and President of United States Steel Corp., Vice President; Frank Purnell, Chairman of The Youngstown Sheet & Tube Co., Vice President; and George S. Rose, Secretary. Two new Directors are: Robert S. Lynch, President of Atlantic Steel Co.; and Alwin F. Franz, President of Colorado Fuel & Iron Corp.

Grain-Elevator Pours Proceed



Above:—thanks to speedy slip forms, 10 days of pouring accounted for this much progress on the bins. Below:—on the work platform atop the bins, men watch water levels and, at a signal from a central station, jack up the forms ⅛ to ¼ inch.



Slip Forms Speed Erection of Head House and Storage Bins On 4½-Foot Flat-Slab Floating Foundation

(Photo on page 1)

• SLIP-FORM construction—the contractors' version of the Hindu rope trick—was used recently to speed erection of a Milwaukee grain elevator. The structure is the largest brewery-owned grain elevator in the world. It is the second-tallest building in Wisconsin. And the contractor believes it is the tallest work building in the world.

The elevator has 72 storage bins with a total capacity of 3,500,000 bushels. It was built for the Jos. Schlitz Brewing Co. by Klug & Smith Co., of Milwaukee, Wis., at a total cost of more than $3,000,000. When in use, the Milwaukee elevator will hold more than half a year's supply of barley for the world's largest brewery, and will enable Schlitz to have practically all its grain stored in company-owned elevators.

The bins are in two sections with an over-all length of 439 feet. They are 93 feet wide and 147 feet high. The head house at the west end of the bin sections adds another 38 feet to the length and is 86 feet 6 inches wide and 297 feet 11 inches high.

There are 42 large cylindrical bins—three rows of 14—each with a diameter of 30 feet and a storage capacity of 75,000 bushels. In the interstices are 24 smaller star bins with a capacity of 15,000 bushels each. In addition there are 6 "half-star" bins, two each at the east and west ends of the west bin section and at the west end of the east bin section.

More than 62,000 yards of concrete and 2,700 tons of reinforcing steel went into the construction. Priorities were granted for critical reinforcing steel because the Government needs storage space for grain, and much space that Schlitz is now using in private elevators will be released when the company begins storing its grain in the new elevator.

The slip-form method of construction, in which Klug & Smith specializes, works much like the famous rope trick. Instead of throwing a rope into the air and climbing it, the contractor throws up steel rods and jacks himself up them, pulling the building platform and forms upward inch by inch. The entire building or section of a building, is then poured in a single solid mass of concrete, and the need for erecting and removing successive layers of forms is eliminated.

Excavation, Foundation

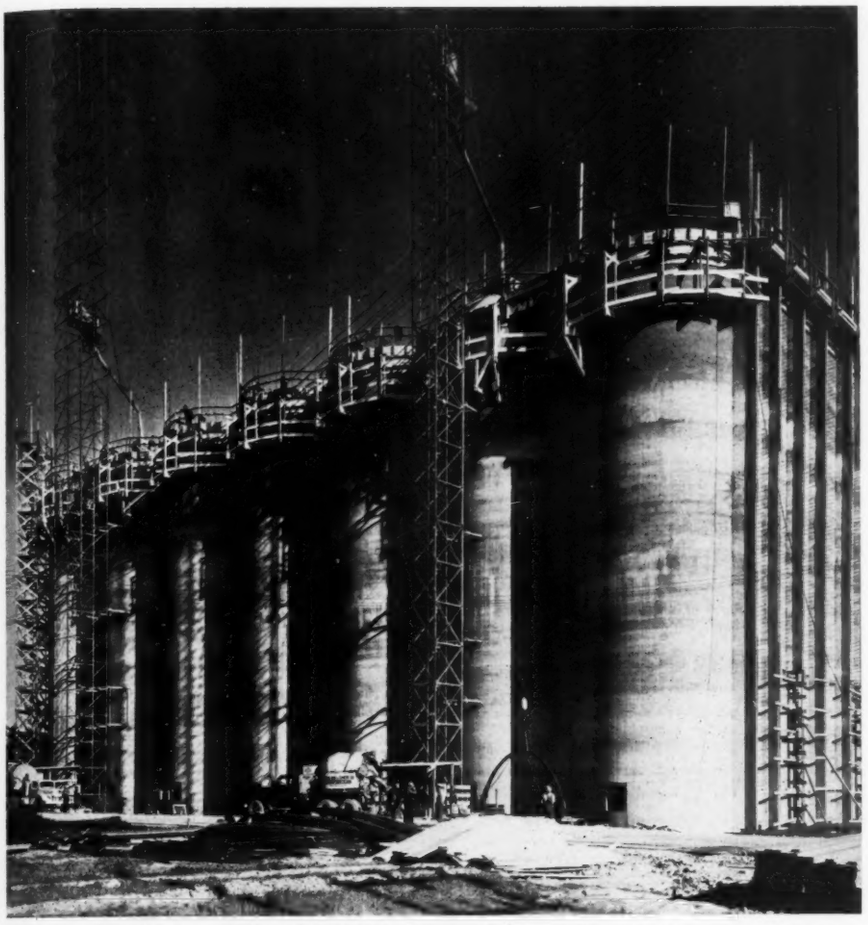
Excavating and foundation work was done in the fall of 1950. A 4-foot 6-inch flat-slab monolithic floating foundation provides support for the superstructure. The Raymond Concrete Pile Co. of Chicago had taken test borings at the site and found nothing but limestone at 22 feet below datum. The land was capable of supporting easily the required load of 6,000 pounds per square foot, so no piling was needed.

Using 2-yard shovels and working around the clock, the excavators cleared the land and excavated to a depth of 15 feet in six days. Three foundations were then laid—one for the head house and one for each of the two sections of bins—and all sections of the foundation were joined with expansion joints. The foundation was made in sections because of the length of the structure. In grain-elevator construction, it is not considered advisable to have more than

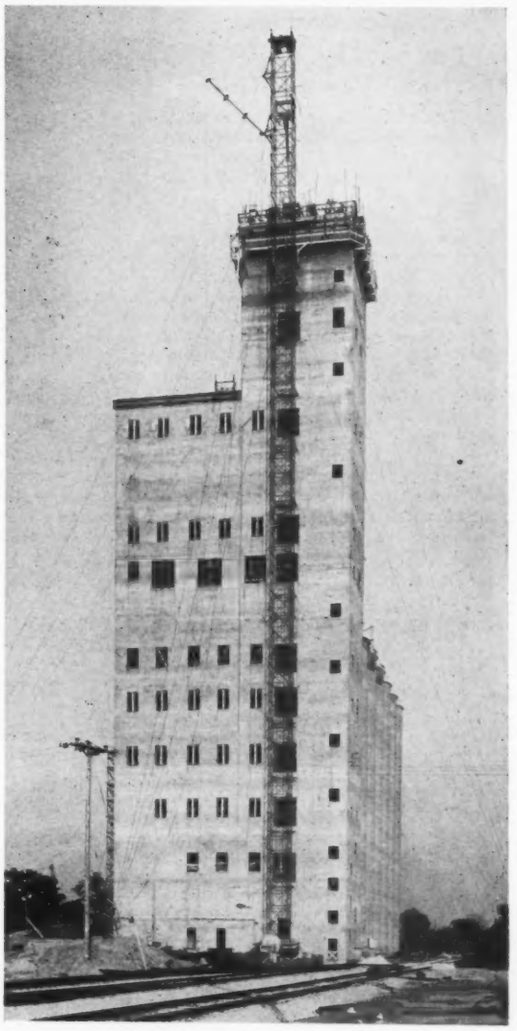
(Jos. Schlitz Brewing Co. Photos)

(Continued on page 66)

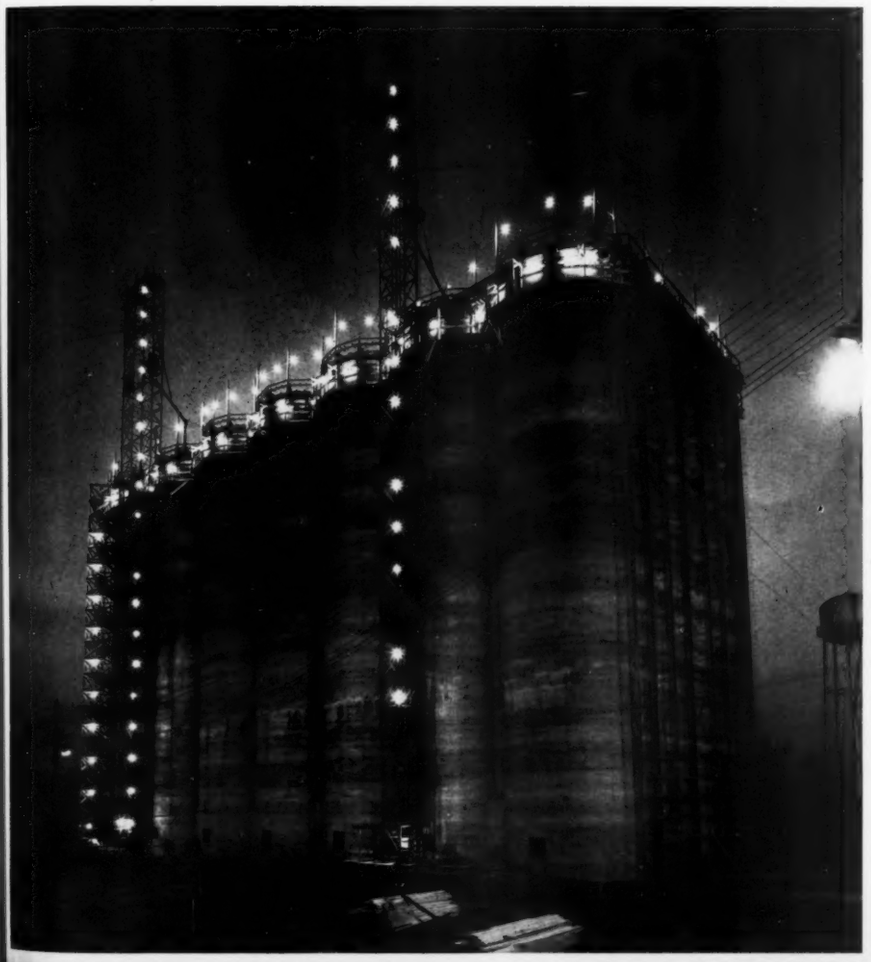
Around the Clock

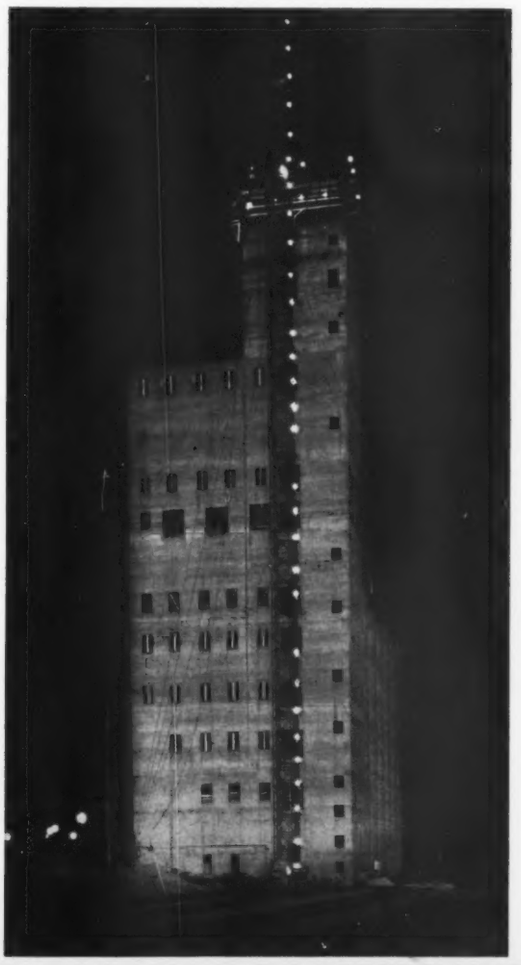


Bin pours proceeded by sunlight and floodlight, the concrete being delivered by truck mixers, lifted by hoist towers, and carted from the tower funnels to the pour by concrete buggies. In the daytime view, note the dowels at right for attachment to the head house.



The 31-story head house, too, was poured 24 hours a day. Where its width decreases, the slip form was severed and a new fourth side built. The structure was completed in 28 days.





Grain-Elevator Pours Proceed Around Clock

(Continued from page 64)

200 feet of length resting on a single slab, because of the danger of overloading one end of the foundation when bins at one end are loaded and the others empty.

First a continuous mat of reinforcing bars and rods, ranging in thickness from ⅝ inch to 1¼ inches and weighing 600 tons, was laid. Fifteen trucks then brought in a steady flow of 6-bag 3,500-pound-test ready-mixed concrete. The concrete was tested at the mixing plants before delivery, by Klein Inspection Service of Milwaukee. Each section was poured in less than 24 hours. Approximately 16,000 yards of concrete went into this foundation.

Jos. Schlitz Brewing Co. Photo

Two-yard shovels, working around the clock, completed the excavation for the grain elevator to a depth of 15 feet in six days.

Superstructure

The superstructure was built in three sections. A unit containing half of the bins—the half to be attached to the head house—was poured first to provide lateral support for the tall, thin head house. The head house was the second unit to be erected, and the second half of the bins was the final unit.

First Bin Section

The first bin section was completed in 12 days of round-the-clock pouring. A slip form 4 feet high of matched and dressed long-leaf yellow pine was assembled in place on the job. One form, outlining the 21 large bins and the 16 smaller bins, was used for all exterior and interior walls. Inside the bin forms, in the spaces where no concrete was to be poured, the roof-slab shoring was placed. This shoring was attached to the forms and was raised with them, serving as a working platform throughout the entire construction.

More than three hundred 1-inch high-carbon-steel vertical rods were placed in the spaces where concrete was to be poured. To each of these rods was attached a special heavy-duty jack. The jacks normally used for this type of construction were not strong enough for the heavy load, so Klug & Smith Co. made for this job special lifting jacks with steel yokes. These jacks were in turn fastened to the tops of the forms. The workmen, turning the jacks, lifted themselves into the air as they progressed. Fourteen-foot jack rod extensions were continually spliced as the work progressed, but the first rods alternated between 7 and 14 feet so the splices would be staggered.

Six-bag minimum-3,500-pound-test ready-mixed concrete was brought to the site in 15 trucks. It was hoisted to position by two 300-foot Archer and Insley hoist towers, which were powered by 100-hp American Hoist & Derrick engines. Concrete buggies then

(Continued on next page)

WHY SKILLED WORKMEN Prefer

RIDGID

Small Ratchet Threaders

Drop head sets to thread ⅛" to 2"

These Drop Head Dies Give You *Extra* Fast Easy Pipe Threading

- ★ Heads snap into ratchet ring from either side, won't fall out.
- ★ Precision-cut alloy dies reverse for close-to-wall threads—no special dies needed.
- ★ 00R & 0R, ⅛" to 1"; 111R and 11R, ⅛" to 1¼"; 12R, ⅛" to 2". Conduit dies available.
- ★ Buy at your Supply House.

RIDGID Bolt Dies 00R-B ¼" to 1", National Coarse and Fine Thread

THE RIDGE TOOL COMPANY • ELYRIA, OHIO

RIDGID Work-Saver Pipe Tools

Minimum Bracing WITH Sonotube®

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For ROUND COLUMNS of CONCRETE

LAMINATED FIBRE TUBING

for one time use

Save TIME LABOR MONEY

IMMEDIATE DELIVERY

Easy to handle Sonotubes are recognized by architects and engineers as an improved LOW COST method in forming concrete columns, piers, piles, underpinning and for many other uses. Sizes 3" to 24" I.D.—up to 24' long. Saw to any length on job.

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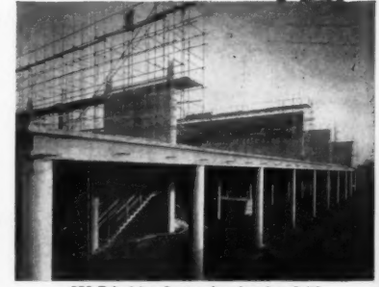
A few territories are open for qualified distributors interested in stocking and promoting SONOTUBES. Write for details.



CBS Television Center, Los Angeles, Calif.
Pereira and Luckman, Architects
William Simpson Construction Co., Contractor
Photo by EZRA STOLLER

Write for complete information and prices

SONOCO PRODUCTS COMPANY
Construction Products Division
HARTSVILLE, S. C. MYSTIC, CONN. GARWOOD, N. J. BRANTFORD, ONT.

carted the concrete from the tower funnels to where it was to be poured. Sixty to 70 yards of concrete was used for each foot of height. The exterior bin walls are 9 inches thick and the interior bin walls 8 inches thick.

Once pouring was started, it continued on a round-the-clock basis until the entire section had been completed, in order to provide an uninterrupted bond. On an average day, 12 feet of concrete was poured. The best day's pour was 15 feet 6 inches.

A foreman constantly made slump tests on the concrete at the bottom of the form. When the concrete had set sufficiently to support its own weight, he signaled the control point on the working platform. (The concrete had to support only its own weight since the weight of the jacks, platforms, forms, and men was supported by the jack rods.) The control foreman then blew a whistle and the 250-man crew turned the jack handles, raising the entire forms and working platform from ⅛ to ¼ inch at a time.

Water levels were used to keep the forms and work surface level. Each jack had a water level, marked with a line before the work began. All the levels were connected to a master level with a water barrel located at the center of the work surface. When it was time to raise the forms, the foreman at the water barrel raised it until it was at the desired height, causing the water in each jack level to rise above the mark. Each man then jacked until the water in his level dropped to the mark.

Cement finishers, working on platforms attached at the bottom of the bin forms, finished off the outside concrete surfaces as the forms were raised. This was approximately 8 hours after the concrete had been poured.

Vertical reinforcing consisted of 392 reinforcing rods, ⅝-inch size, for each silo. Sixteen-foot rods with an overlap on each splice of 18 inches were used. For horizontal reinforcing, the contractor used double rows of rods of varied thicknesses. The first 20 feet had ½-inch rods, the next 66 feet 8 inches had ⅝-inch rods, the next 36 feet had ½-inch rods, and the top 24 feet 4 inches had ⅜-inch rods. Including the head house and all the bins, more than 2,100 tons of reinforcing steel went into superstructure reinforcing alone.

Head House

The 31-story rectangular head house, next unit to be built, was also erected by means of slip forms. Because the surfaces were flat, plywood forms were used to give a smoother finish. Again the roof-slab shoring was used as a work surface and was raised with the forms to its final position. As the job progressed, the head house was attached rigidly to reinforcing dowels left extending from the tanks when the first section was erected. Walls of the head house are 9 inches thick all around. Floor beams were poured as the work progressed, with chases being left in the walls so the floors could be poured later. The entire head house was poured in only 28 working days.

It was completed in two sections: the first pour from foundation to 153 feet 6 inches took 15 days and the final pour from that point to 297 feet 11 inches took only 13 days. Since only the shell was poured at this time and the building was so high, the contractors stopped at 153 feet 6 inches and put in the floors to aid in lateral bracing.

At 217 feet, the width of the house decreases from 86 feet 6 inches to 39 feet 10½ inches, so a section of the form was severed and a new fourth side to

(Concluded on next page)

Jos. Schlitz Brewing Co. Photo

Fifteen truck mixers kept concrete flowing steadily into the foundation mat. Like the rest of the work, pouring was round the clock.

TWIN PRIME PUMPS

. . . Better performance . . . Lower cost

DUAL VOLUTES, fast priming, non-clogging portable, long lasting centrifugal pumps. Distributors—write for attractive proposition.

Write for circular

OHLER MACHINERY CO.

WATERLOO 5 IOWA

LIMA does it up!...up!... UP and OVER!

. . . proof of the extra versatility and perfect balance of LIMA CRANES

LIMA truck cranes are engineered not only for the made-to-order jobs, but with *extra-capacity* for the unusual jobs. Typical is the way this Lima 34-T, with 100′ boom and 20′ jib, hoisted this 24′ x 22′ x 8′ steel tank to the roof of a Columbia, S. C. building. Though the weight was 12,650 lbs. and the height 108′ the LIMA Crane made it possible to handle this tough assignment with ease and precision.

It's on jobs like this that owners and operators appreciate the stability, maneuverability and smooth, easy control of LIMA 34-T Cranes. Their unparalleled stability permits the use of long booms at low angles and extra-high reaches with jib attachments.

Built with crawler, truck or wheel mounting, LIMA Cranes have travel speeds that range from 1 mph to 31 mph depending on mounting. Rubber-mounted machines have capacities up to 35 tons depending upon the type, and are available with crane, dragline or pullshovel front ends.

Baldwin-Lima-Hamilton Corporation
Construction Equipment Division, Lima, Ohio

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OFFICES IN PRINCIPAL CITIES OF THE WORLD

BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

Grain-Elevator Pours Proceed Around Clock

(Continued from preceding page)

the form was built at the 39-foot 10½-inch width.

The head house has spiral reinforcing to a height of 167 feet; above that, column bars tied together. One hundred and fourteen jacks were used for this section.

Second Bin Section

The last unit to be poured was the east section of tanks—those farthest from the head house. Klug & Smith poured this section, which consisted of 21 large and 14 small bins, in 14 days, using exactly the same method as had been used for the first set of tanks. It was separated from the first group of bins by 7 feet but was joined to it by means of expansion joints. This method of joining is considered safer than solid construction since it prevents a heavy load on one end from putting too uneven a strain on a floating slab foundation. At the same time it is economical, since it permits all the bins to be served by a single head house.

The last set of bins was finished in November, 1951. The contractor then poured the gallery floors.

Car Dump

Link-Belt, Inc., has installed a car dump in the grain elevator which completely unloads a box car 50 feet long in five to eight minutes. It clamps the box car into position, tilts it 10 degrees to the side, opens and removes the grain door by raising it to the top of the car, tilts the car 40 degrees from the horizontal in the first direction, and finally returns the car to its original position. This is the first car dump that has been installed in a brewery grain elevator by the Link-Belt firm.

Personnel

Brunner, Laws, Gemeny & Odean, Industrial Engineers, of Chicago, specialists in grain-elevator work, designed the building.

George Hardy was Job Superintendent and Fred C. Schelong was Project Manager for Klug & Smith Co. The firm has constructed grain elevators throughout the middle west for more than 30 years. Schlitz personnel in charge of supervising construction were Henry Jacobson, company engineer; Joseph G. Schier, company architect; and John C. Spiekermann, Jr., company resident engineer.

The grain elevator is part of Schlitz's multi-million-dollar post-war expansion program that has included a modern bottle house and storage facilities for empty bottles and other supplies.

C. C. Sunderland Retires; Birdsall Succeeds Him

After more than 50 years' service, Charles C. Sunderland, Chief Bridge Engineer for John A. Roebling's Sons Co., Trenton, N. J., has retired. His successor is Blair Birdsall, who has been Assistant Chief Bridge Engineer since 1940.

Mr. Sunderland's active career with Roebling covered a period during which the company completed such major contracts as the main cables of the George Washington Bridge, the Golden Gate Bridge, and the Tacoma Narrows Bridge. Considered one of the world's foremost bridge engineers, Mr. Sunderland is a member of the American Society for Testing Materials, the American Concrete Institute, and the National Advisory Board on the Investigation of Suspension Bridges.

Mr. Birdsall joined the Roebling Bridge Division in 1934 and has assisted with engineering design on the Golden Gate Bridge and other contracts. For the past 12 years he has managed Roebling suspension-bridge and tramway contracts. These have included the Peace River Bridge along the Alaska Highway and the Tacoma Narrows Bridge.

Posts With Army Engineers

The Corps of Engineers, U. S. Army, is in urgent need of experienced engineers for work on civil and military projects in its New York district. The work is located in the states of New York and New Jersey. The following are the types of engineer required. All salaries are per annum:

Architectural engineers (estimates):	$7,040
Architectural engineer (specifications:)	$7,040
Materials engineer (roads, paving, etc.; design-inspect-test concrete, bituminous, soils, etc.):	$5,060
Electrical engineer (inspection; installation of electrical equipment in buildings):	$5,060
Mechanical engineer (heating, air-conditioning, refrigeration, etc.)	$5,060
Construction inspector (concrete; inspect-test-mix concrete):	$4,620
Cartographic compilation aid:	$4,205

Interested engineers may obtain further information by applying to the Personnel Branch of the Corps of Engineers, U. S. Army, New York District, 80 Lafayette St., New York 13, N. Y.

Heads Flexible Steel Sales

John P. Ramsey is the new Sales Manager of Flexible Steel Lacing Co., Chicago, Ill., manufacturer of conveyor and transmission-belt fasteners. He succeeds Hugh L. Coats, who is leaving his post after 38 years as Sales Manager but is continuing as Secretary and Director of the company.

Mr. Ramsey represented Flexible Steel in the New York and New England area before returning to the home office in Chicago four years ago to assist in sales management.

Go by these plain, hard Facts... and SAVE!

CHEVROLET Advance-Design TRUCKS

Fact No. 1 — Saves you money on purchase
Check the price on a Chevrolet truck that's the right size, type and capacity to handle your work. You're going to find that this Chevrolet truck lists for less than any other make of truck capable of doing the job. Here's an immediate, cash saving.

Fact No. 2 — Cuts operating costs
Day in, day out a Chevrolet truck works for rock-bottom "wages" on fuel and upkeep. It brings you the proved economy of Valve-in-Head engine, with 4-Way Lubrication to reduce engine wear. Extra-rugged features cut maintenance costs.

Fact No. 3 — Gives you the right truck for the job
Chevrolet trucks are factory-matched to the job—tires, axles, frame, springs, engine, transmission, brakes. It's the Chevrolet idea to provide you with exactly as much truck as you need and no more. Chevrolet truck users know this idea pays off.

Fact No. 4 — Saves money on trade-in
It's right in the records that Chevrolet trucks traditionally bring more money on the used truck market—and that can mean more money for you when you trade or sell. There's another reason why more truck users choose Chevrolet than any other make.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

CHEVROLET first in demand in value in sales

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Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

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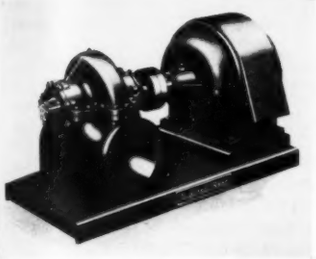


A double shaft seal prevents air leakage in the Ingersoll-Rand DMV pumps when operating under suction lift.

Double Shaft Seals Improve Pump Line

Improvements have been announced in the line of small single-stage double-suction pumps made by Ingersoll-Rand, 11 Broadway, New York 4, N. Y. The Class DMV-DHV pumps have double mechanical shaft seals with sealed pre-lubricated ball bearings. Built in 3, 4, 5, and 6-inch sizes, the DMV (for medium heads) and the DHV (for high heads) are used at temperatures up to 200 degrees F, capacities to 2,100 gpm, and pressures to 150 psi.

The double shaft seal prevents air leakage into the pump when it is operating under suction lift. It also has a longer service life when the pump is handling gritty and abrasive liquids. External sealing liquid is injected to the seal box under pressure, lubricating the seal faces and preventing the gritty fluid from reaching them.

The cartridge-type ball bearings are permanently lubricated. The elimination of stuffing boxes has decreased the shaft length between bearings, making the finished shaft more rigid. The shaft is not threaded, reduced, or slotted at any point over its unsupported length. The impeller is attached by a shrink fit, much as high-pressure turbine wheels are mounted.

Three spare-parts kits serve all eight pumps in the DMV-DHV line. They contain all the parts required to restore the pump to its original performance.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 266.

Bulletin on Vibrators

A catalog on electric and gasoline-powered concrete vibrators is distributed by Master Vibrator Co., 100 Davis Ave., Dayton 1, Ohio. It covers the wheelbarrow-type generating and power plants, the ac-dc hand models, and the surfacing tools.

Vibrating ends have sealed matched bearings with a one-piece Bakelite retainer. The tube and the sealed top cap of the vibrating end are made of special abrasion-resistant steel.

The surfacing tool is used in connection with the vibrator power unit for wet rubbing, dry grinding, and wire brushing of concrete. Speed reducers and water cans are furnished for wet rubbing or grouting.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 261.

Solvay Combines Divisions

The Solvay Process Division and the Solvay Sales Division, New York, N.Y., have been consolidated and are now known as The Solvay Process Division, Allied Chemical & Dye Corp. The former Solvay Sales Division has become the sales department of The Solvay Process Division. President of Solvay Process is A. B. Chadwick; Vice President in Charge of Operations is Carlton Bates; H. F. Merritt is Vice President in Charge of Sales; and L. B. Gordon is a vice president.

The executive sales office has moved from 40 Rector St. to 61 Broadway, New York 6, N. Y.

Rubber-Tire Rollers

A line of full oscillating pneumatic-tire rollers is made by Lewis-Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Texas. BMCO models are available with 9, 11, 13, or 15 full-oscillating wheels. Front and rear wheels are staggered for full coverage of the area.

The front-wheel assembly yoke, mounted on a heavy oscillating pin, is attached to a turn-table with king pin which prevents the wheels from rolling forward or back when detached from the tractor. The pull tongue is hinged at the yoke so that the operator lifts only the end of the tongue when attaching to a tractor. Supports between tires are horizontal at the point of oscillation to eliminate tire side-wall wear.

Here's a rear view of the BMCO Model LB-13-S rubber-tire roller. All wheels conform to uneven ground conditions.

The turning radius on the smallest model is 9 feet 8 inches and on the largest model, 12 feet. Ballast capacity varies from 110 to 155 cubic feet. Ground pressure is a minimum of 50 and a maximum of 350 pounds per linear inch of tire tread width.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 287.

Linde Elects President

Thomas D. Cartledge is the new President of Linde Air Products Co., a division of Union Carbide & Carbon Corp., New York, N. Y. Mr. Cartledge joined Linde at the end of World War I and has filled various posts in the organization. At the time of his present appointment, he was Senior Vice President, Director, and a member of the Executive Committee of Linde.

TELSMITH ENGINEERED

for High Capacity... and Super Flexibility

Barbers Corners Crushed Rock, Washed Sand and Gravel Plant of the Elmhurst-Chicago Stone Co., Elmhurst, Illinois. (Top) one of several Telsmith Vibro-King Screens; (left) Telsmith Scalping Screen, Gyratory and Gyrasphere Crushers.

TELSMITH Equipment in This Plant

One (1) 36" x 6' Heavy-Duty Plate Feeder
One (1) 5' x 12' Heavy-Duty 2½-Deck Scalping Screen
One (1) 16-B Gyratory Crusher
One (1) 48-S Gyrasphere Crusher
Five (5) Vibro-King Finishing Screens: 5' x 12', 4' x 12', 4' x 10' Triple Decks; 4' x 12' Double Deck
Nine (9) Telsmith-BG Conveyors: 30" to 18" wide and 266' to 45' long

C-29

FIVE-WAY EFFICIENCY—(1) High Capacity... (2) Super Sizing-Flexibility... (3) Simplified, Automatic Controls... (4) Large Storage Capacity... (5) Fast Truck-Loading... makes this plant unique. Because it is not only Telsmith engineered but largely Telsmith equipped.

THREE-SECTION DESIGN—This outstanding sand and gravel plant can produce—In Section One, minus 1" pit-run road gravel. In Section Two, four sizes of washed gravel, and sand. In Section Three, five sizes of crushed gravel and one of aglime. This three-section plant consistently and economically produces 350 tons per hour.

CONSULT TELSMITH ENGINEERS for newest developments in aggregate production. Send for Bulletin 266.

SMITH ENGINEERING WORKS, 4014 N. HOLTON STREET, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17 — 211 W. Wacker Dr. Chicago 6, Ill. — 713 Commercial Trust Bldg. 238 Main St. Philadelphia 2, Pa. — Cambridge 42, Mass. — A. N. Wigle Columbus 9, Ohio

Rish Equipment Co. Charleston 22, S.C. & Clarksburg, W.Va. — Rish Equipment Co. Roanoke 7, & Richmond 10, Va. — Interstate Eqpt. Co. Statesville, N.C.

David Bonner, new President of The Moles. Mr. Bonner is Vice President of Frederick Snare Corp., New York, N. Y.

Bonner Heads Moles

The Moles, New York association of tunneling and heavy-construction men, elected a new president at the annual meeting last May. He is David Bonner, Vice President of Frederick Snare Corp., New York, N. Y. Mr. Bonner is a civil-engineering graduate of Princeton University. His 43 years' experience includes work on piers, bridges, dams, interceptor sewers, subways, and the New York World's Fair Tide Gate. Some of the firms with which Mr. Bonner has been connected are Raymond Concrete Pile Co., Rogers & Hagerty, and Metropolitan Sand & Gravel Co. (of which he was Vice President and General Manager). He has been with Frederick Snare since 1942, having charge of such projects as piers for the Navy at Charleston, S. C., foundations for the Chesapeake Bay Bridge, and the new Atlantic Beach Bridge.

Other officers elected at the meeting include: Richard E. Dougherty, Consulting Engineer, First Vice President; George F. Ferris, Raymond Concrete Pile Co., Second Vice President; Charles E. Simmons, Bethlehem Steel Co., Sergeant-at-Arms; Harry T. Immerman, Spencer, White & Prentis, Secretary; Howard P. Maxton, Raymond Concrete Pile Co., Treasurer.

New trustees are: Peter F. Connolly, The Peter F. Connolly Co.; Andrew Fischer, Jr., Cauldwell-Wingate Co.; Eugene G. Rau, J. Rich Steers, Inc.; James G. Tripp, Tripp Construction Co.; Edward P. Palmer, Senior & Palmer, Inc.

Celebrates 125th Birthday

Few firms in the United States have reached or passed their 125th year (only 14, according to one record) and Joseph Dixon Crucible Co., Jersey City, N. J., is one of them. In 1827, Joseph Dixon settled down in Salem, Mass., to do a regular business of manufacturing and selling graphite crucibles, graphite stove polish, and eventually lead pencils and crayons.

Today, in its 125th year, Joseph Dixon Crucible Co. manufactures not only pencils, crayons, rubber erasers, crucibles, and refractories, but stresses the use of refined graphite as a lubricant—in its dry form and in combination with oils and greases—for heavy machinery. The firm has added to its other products dry graphite, graphite lubricants, pipe-joint compounds, belt dressing, and silica-graphite paint.

Joy Promotion for Wearly

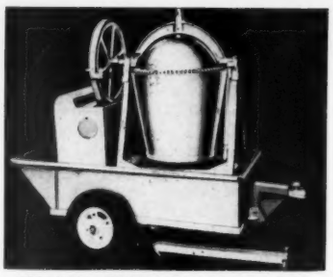
William L. Wearly has taken over the post of General Sales Vice President for Joy Mfg. Co, Pittsburgh, Pa. Mr. Wearly, who joined the organization in 1937, has served as Service Manager and Vice President, Coal Machinery Sales. In his new post he will be responsible for all domestic sales, as well as those in Canada and Mexico.

New Concrete Mixer Has Aluminum Parts

A lightweight portable concrete mixer that can mix a 3-cubic-foot batch of concrete in 2 minutes is announced by Wright Engineering & Supply Co., 1304 S. Bannock St., Denver 10, Colo. The bowl, pulley wheel, yoke, and end bearing castings are all formed of aluminum alloy.

The steel drum is machine-rolled and flanged to the bowl in a continuous rivetless joint; it turns on a steel shaft. The entire unit is mounted on an electrically welded framework of steel angle and gusset plates. The total weight is 147 pounds.

Mixing is done by 4 paddles, 2 in the front and 2 in the back near the bowl. Paddles may be interchanged for mixing plaster and mortar as well as concrete. All models are high enough so that loads can be poured directly into a wheelbarrow from the mouth of the drum. The mixer loads and discharges from either side, and the smooth inside surfaces assure free dumping and easy cleaning, the manufacturer points out.



This is the Wright Model 3 EBG 3-cubic-foot concrete mixer. Bowl, pulley wheel, yoke, and end bearing castings are aluminum alloy.

A trailer and steel mortar box for use with the mixer are also available. Constructed of steel angle, the trailer comes complete with hand tongue and hitch, plus pneumatic rubber tires mounted on split-type aluminum wheels which are equipped with ball bearings grease-sealed for life. The mixer can be bolted to the trailer for transportation or carried separately in the mortar box riding on the trailer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 272.

Arthur B. Summers Dies

Arthur B. Summers, Sales Engineer of Dewey & Almy Chemical Co., Cambridge, Mass., died on May 16 at the age of 57. Mr. Summers, who was well known among highway officials and engineers, handled sales for the company's Construction Specialties Division in the eastern seaboard states.

When you can't afford "down time"

that Pioneer Edge

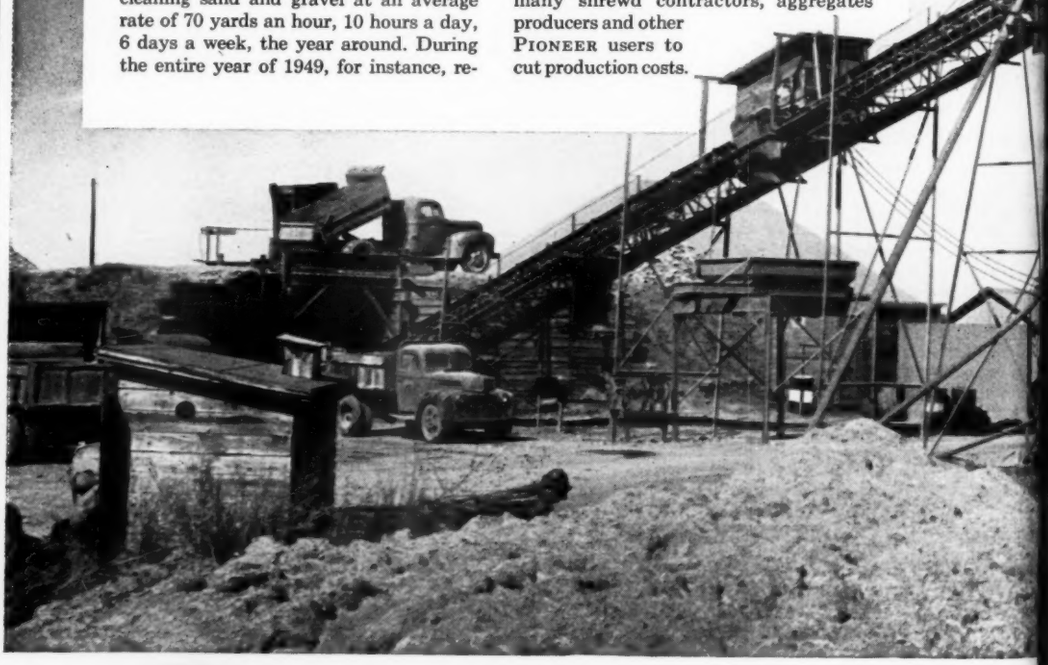
Texas producer has record of only 2 days "down time" in 5 years

● You can't make money with idle equipment . . . especially with a big crew of men standing by while you shut down to replace a classifier or repair faulty gears or bearings.

You can understand, then, why Fort Worth Sand & Gravel Co. is so enthusiastic about PIONEER equipment. Shown here is their Thomas Plant, located near Richland Hills, Texas. Since its erection five years ago, this PIONEER Washing Plant has been cleaning sand and gravel at an average rate of 70 yards an hour, 10 hours a day, 6 days a week, the year around. During the entire year of 1949, for instance, repairs took just 45 minutes. Over the 5 year period, only 2 days have been lost due to breakdown.

When we asked Howard Rowland, the foreman, how long a conveyor belt lasted on the job, he replied, "I don't know . . . I've never needed a new one."

Unusual? Not at all. PIONEER plants are noted for extra ruggedness and long life. This is just another example of how that famous PIONEER EDGE is enabling so many shrewd contractors, aggregates producers and other PIONEER users to cut production costs.



BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer Continuflo EQUIPMENT

A Bluegrass Sodding Beautifies 15 Acres Of State Capitol Hill

The State of Tennessee plans to spend over $7,000,000 to redevelop its Capitol Hill area in the heart of Nashville. Part of this program is now under way. New state offices and library, a modern commercial district, widened streets, and attractive park areas will replace the slums which now lie on the lower edge of the hillside. The Nashville Housing Authority presented a full report, with model studies, to the City Council in April, 1952. Earlier phases of the work were started in 1950. Part of the work done this year includes landscaping of 15 acres on the north and east side of the Capitol Building.

McDowell & McDowell, Nashville, Tenn., contractor, is doing the work. The State purchased the area behind the Capitol and had the existing buildings demolished. The landscape contract calls for 50,000 cubic yards of fill to build up the hill area, and over 20,000 square yards of bluegrass sodding for cover.

C. & E. M. Photo

A Champion sod cutter drawn by an International tractor cuts 12-inch-wide strips for the Nashville landscaping.

C. & E. M. Photo

As a GMC truck is unloaded, McDowell workmen tamp the sod into place.

Fifty GMC 4-yard dumps, two D4 Traxcavators, and two Cat D6's are taking care of the fill work. The Traxcavators are working in a borrow pit 12 miles from town, loading the trucks for the haul to the city. The D6's spread the dump loads to bring the hill to desired grade.

McDowell obtains the sod from the state-owned Clover Bottom Farm, 15 miles from the Capitol. A tractor-drawn Champion sod cutter manufactured by M. R. Lane & Sons, Ardmore, Pa., slices the bluegrass in 12-inch widths to a full 3-inch thickness—well below the grass roots. About 4 inches are left between strips so the grass will grow back over the area. As the cutter moves across the field, two men follow it slicing the strip crosswise with a hand cutter every 12 inches. Four men load the 12 x 12 chunks onto the trucks and trailers.

At first the squares were put flat on a 6-foot x 12-inch board, then set on the trucks. But this was found to be unnecessary and they are now loaded straight on the truck or trailer. The job keeps McDowell's three GMC trucks and three flatbed trailers going all the time.

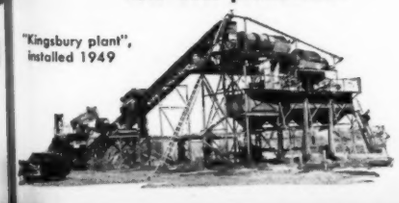
Six or seven laborers unload the sod at the site and place the squares in neat lines on the hillside. Just before the squares are set, a 6-8-6 fertilizer is put down over the fill at the rate of about 1,000 pounds per acre. Two men tamp the soil and work the squares into place. Then follows a good watering.

Porter Dunlap, State Property Administrator, is in charge of the work for the State of Tennessee. Loren Moore and Howard Hall are Superintendent and Foreman, respectively, for McDowell & McDowell.

keeps your plant going

Two more Pioneer Plants guarantee Fort Worth Sand & Gravel Company low cost production.

"Kingsbury plant", installed 1949



"Britain plant", installed 1950

PIONEER ENGINEERING WORKS
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(SUBSIDIARY OF POOR & COMPANY • CHICAGO)

• Please send information on the equipment checked.

- ☐ GRAVEL PLANTS
- ☐ ROCK PLANTS
- ☐ JAW CRUSHERS
- ☐ ROLL CRUSHERS
- ☐ WASHING PLANTS
- ☐ ORO FEEDERS
- ☐ BITUMINOUS PLANTS
- ☐ APRON FEEDERS
- ☐ MECHANICAL FEEDERS
- ☐ VIBRATING SCREENS
- ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ CONTINUFLO CONVEYORS

Name_____
Company_____
Address_____
City_____ Zone____ State_____

Safety Devices for Boilers

A 24-page catalog on safety devices for steam and hot-water boilers and heaters is available from McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago 18, Ill.

It displays water feeders for boilers and for receiving tanks; low-water fuel cut-offs for low and high-pressure boilers; float-operated switches; temperature and pressure relief valves; float valves; and related products. Capacity curves, dimension drawings, and engineering information are included to guide proper selection.

This literature may be obtained from the company, or by using the Request Card bound in at page 16. Circle No. 256.

Lange for Hyster-Washington

Robert Lange is the newly appointed head of the Washington, D. C., office of Hyster Co., Portland, Oreg., manufacturer of lift trucks and tractor equipment. In his new job, Mr. Lange, who has been with the company 11 years, will handle Hyster's sales to various Government agencies.

The Fendall chippers' cup-type goggle is designed for comfort and pressure-free fit.

New Cup-Type Goggles

A line of cup-type goggles has been introduced by Fendall Co., 4631 N. Western Ave., Chicago 25, Ill. It includes chippers', welders', and dust and splash goggles. The company emphasizes their comfort and pressure-free fit. Each eye cup is individually molded to conform to eye areas of the face, with wide-bearing facial contact surfaces in order to distribute the weight evenly.

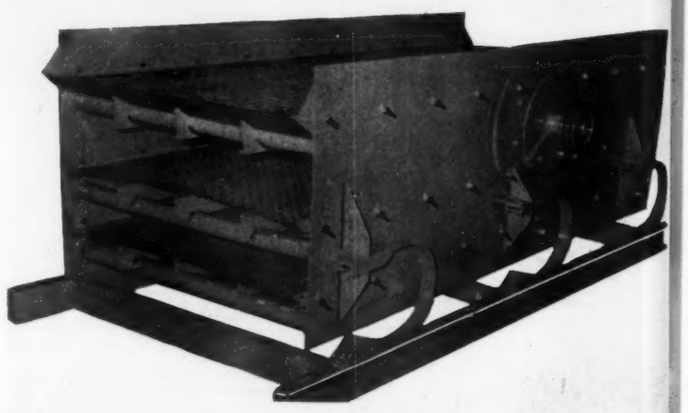
More than 300 perforations in the side-shield allow air to circulate. Slots in the lens ring provide circulation across the inner lens surface to reduce fogging. Herringbone-shaped channels in the lens seat allow air entrance but block out foreign particles.

Both the dust goggle and chippers' goggle are available in transparent models with special side-shield ventilation. All models have a ball-chain nose bridge, with quick-acting lever-type lock for easy adjustment. Lens rings are the free-turning screw type of anodized aluminum for easy lens changing. The long-stretch headband is adjustable.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 260.

Vibrating Screens

New large-size vibrating screens are announced by Kolman Mfg. Co., 5922 W. 12th St., Sioux Falls, S. Dak. The Series C includes a single-deck model 42 inches wide in 6½ or 7-foot lengths, for use with large bucket loaders, 30-inch portable belt conveyors, etc. Multiple-deck units 3 and 4 feet wide and ranging to 8 and 10-foot lengths are also available.



Kolman Series C multiple-deck vibrating screens are now available in models 3 and 4 feet wide, ranging to 8 and 10 feet long.

The screens have a spring design to give full freedom of vibrating movement and absorb vibrations so that they are not transmitted to the attached equipment. Heavy-duty springs and bearings are used for long service.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 397.

Heltzel BUILDS IT BETTER

HELTZEL HELPS
CONSTRUCTION DOLLARS
GO FURTHER

NASSAU DOCKS, INC.
REORDERS HELTZEL BINS
Often empties over 3 bins per hour

PROBLEM: To have overhead storage of 1½", ¾", ⅜" stone and run-of-crusher limestone screenings which are delivered in barges; to fill and empty the bins quickly into trucks having 14 to 16-yard capacity; to deliver aggregates in proper proportion from the same bins to an asphalt plant on a conveyor belt. These were the Nassau Docks, Inc., problems.

SOLUTION: Nassau Docks, Inc., ordered four 18-foot diameter, 150-ton capacity Heltzel bins, and at a later date, six more. A two and one-half yard clam-shell loads the bins. For discharging, double-acting clam-shell gates (16" x 16") operate from the ground level. During busy days at Nassau Docks, three or more bins are emptied per hour. The superintendent says that any one of 4 aggregates, or any combination of them, can be moved on the conveyor belt to the asphalt plant.

● Nassau Docks, Inc., furnishes aggregates for its own asphalt plant, for contractors and Hendrickson Brothers, with whom Nassau Docks is allied. Specialized Heltzel engineering features circular and square bins; 50-degree sloping sides of cone; a choice of clam-shell, single arc or roller gates ranging in size from 12" x 12" to 30" x 30" which are air or manually operated.

Ease of assembly is testified to by steel erectors time after time. Heltzel has solved hundreds of similar problems effectively; so why don't you write regarding your storage, loading, mixing, unloading, batching or materials handling problems?

Heltzel BUILDS IT BETTER
The Heltzel Steel Form & Iron Company
Construction Equipment Since 1910
Flex-Plane
WARREN, OHIO

3 men do the work of up to 10 men with Twin Bin

TWIN BIN
ON THE JOB

BRIDGES
CULVERTS
BUILDINGS
HOUSES

THINK OF IT!

- ★ TWIN BIN SAVES TIME, SAVES LABOR, SAVES MONEY
- ★ Faster pour, no waiting on mixer skip to be filled
- ★ Three trip gates are ONLY moving parts
- ★ Easy to move, easy to set up, easy to load
- ★ Height of STOCK BIN allows use of small, low-priced loaders
- ★ No extra labor to hunt up
- ★ Adaptable to 1-2-3 bag mixers and your operation
- ★ Safe to use—easy to operate

THE TWIN BIN aggregate handler is shown in use on a bridge pour made in Iowa by the Barker-Rose Construction Co. The TWIN BIN operator is watching the face of the scale indicator of the wheelbarrow scale while the correct weight of sand and gravel pour from the STOCK BIN into the SCALE BIN. The batch will be poured directly into the mixer skip. Note the dividing wall of the stock bin and loader with materials stocked well ahead of their need.

For complete information on how to use Twin Bin on your job, write

CIMCO, BOX 442 MARSHALLTOWN, IOWA

Write for information on distributor territories now open

Only TRIPLEX BACKFILL TAMPERS
offer you these BIG Advantages

FAST 75 sq. in. of effective compaction area pounded and vibrated at the same time, resulting in 5 times the speed of work by one man.

HIGHER LIFTS 20% higher lifts and still meets specifications. No wasted energy in recoil.

UNIFORM COVERAGE Easy to control, wide pattern makes systematic coverage of a compaction area easy.

EFFICIENT Only ½ inch vertical movement of unit allows ease of control. One man can do 5 men's job with less effort.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

National Labor Law Is Applied to Dam Project

THE PROBLEMS: *Group A comprised contractors jointly constructing a Government dam wholly within Arkansas. As Group B, the same contractors furnished the needed materials. More than half of over $6,000,000 worth of materials and labor was secured from outside the state. (1) Were the two groups subject to National Labor Relations Board orders to refrain from unfair labor practices? (2) Was Group B guilty of unfair labor practice if a supervisor representing both groups threatened employees of Group A to influence their votes in the election of a union to be their bargaining representative? (3) Was it unfair labor practice to use an employment application form requiring statement as to the "trade, professional, fraternal, etc.," corporation to which applicant belonged?*

THE ANSWERS: (1) Yes. (2), and (3) No. (National Labor Relations Board v. Ozark Dam Constructors, 190 Fed. 2d 222, decided by the United States Court of Appeals, Eighth Circuit.)

Summary of court's reasoning: The contractors were not engaged in "interstate commerce or the production of goods for commerce" within the meaning of the law. But their venture came within the law as one "affecting commerce". As decided by the United States Supreme Court, the test of the Board's jurisdiction is not the volume of interstate commerce that may be affected by unfair practices, but the existence of an employer-employee relationship such as may result in disputes obstructing or burdening commerce. It is for the Board, not the courts, to determine whether an unfair practice will so result.

But the fact that the supervisor, employed by both groups, may have threatened employees of Group A did not constitute an unfair practice by Group B. There was no evidence that the supervisor spoke on behalf of the latter group, or that its employees knew of the threat or were affected by it.

As to the application form, it did not appear that any applicant had been required to state his union affiliation or that the form called for information to which the employer was not entitled. There was nothing to show any interference with the rights of its employees.

Contractor Was Entitled To a Federal Tax Refund

THE PROBLEM: *The prime contractor on a Federal construction job agreed to advance funds to a subcontractor to enable the latter to meet payrolls. He also gave a performance bond to protect labor claims. Did the prime contractor thereby become a joint venturer with the subcontractor, and an employer of the latter's men, in such sense as to make himself liable for withholding taxes under the Federal Insurance Contributions Act and the Federal Unemployment Tax Act?*

THE ANSWER: No. (Wm. Simpson Construction Co. v. Westover, Collector of Internal Revenue, 100 Fed. Supp. 125, decided by the United States District Court, Southern District of California, Central Division.)

District Judge Harrison reasoned: A payment bond is required by statute for the benefit of laborers and materialmen, and is not intended as a weapon to be used by the Government in the collection of taxes. The Government properly attempted to collect the taxes from the subcontractor, but when it failed, it was not entitled to turn to the prime contractor. "If it was the intention of Congress to hold a prime contractor liable for the taxes of the subcontractor, it should have said so."

State Not Liable for Delay In Preparing Contract Site

THE PROBLEM: *A booklet of standard specifications for state road and bridge construction in Mississippi provided that structures, poles, etc., to be removed from sites should not be the responsibility of the contractor, "except that he waives . . . claims for interference, delay, or damage on account of their removal or nonremoval". Another section provided for removal by the State or owners; it said that if the structures were not out of the way in time, the contractor should not interfere with them but notify the engineer "in order that prompt arrangements may be made for their removal". Another section specified that payment to the contractor should cover labor and materials, loss or damage arising out of the work, damages for obstructions, etc. The first page of a contract for road work bore a note in bold type to the effect that the standard specifications, which included those above mentioned, were as much a part of the contract as if attached to it. The contract and bond, as well as the proposals, re-*

(Continued on next page)

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(Continued from preceding page)

ferred to the specifications. Could the contractor, who denied knowledge of the provisions of the spex, hold the State liable for idling his equipment when it delayed in removing electric poles along the route?

THE ANSWER: No. (Edward E. Morgan Co., Inc., v. State Highway Commission, 54 So. 2d 742, decided by the Mississippi Supreme Court.)

The court upheld a ruling of the trial judge refusing to receive the contractor's testimony that his attention had not been drawn to the spex.

Rights Under Oral Agreement If Owner Stops Performance

THE PROBLEM: *There was a verbal understanding that a contractor should do certain work at a certain price, but that there should be no binding agreement until a written contract was drawn up and signed. There was no written contract, but the owner authorized the contractor to begin work. Later the owner prevented further performance. Was the contractor entitled to damages, including the profit he would have made had he been permitted to finish the job on the terms agreed?*

THE ANSWER: No. But he was entitled to the reasonable value of the work done by him. (Goldman v. Shapiro, 84 Atl. 2d 628, decided by the New Jersey Superior Court, Appellate Division.)

The court fully recognized that, where there is a binding contract and the owner wrongfully stops performance after some work has been done, the contractor can collect for work performed—on the contract-price basis—plus profits that would have been earned on doing the work he was prevented from doing. But where there is no contract, the contractor can collect only the reasonable value of work and materials furnished.

The New Jersey court's decision seems to depend upon the fact that the contractor evidently admitted there was no binding agreement. So the decision is not to be understood as meaning that, where all the terms of a contract have been orally agreed upon, the parties cannot waive their further understanding that a written contract is to be entered into. In other words, circumstances may be such that when an owner instructs the contractor to proceed with a job bargained for, without any change in terms previously agreed upon, courts will infer that the parties have mutually intended to waive the requirement for a written document. This, of course, assumes that there is no statute in the particular state requiring a contract of this kind to be in writing.

Trespassing Boy Injured: Contractor Was Not Liable

THE PROBLEM: *A contractor's employees left a bulldozer near a street on an unenclosed vacant lot. The soil pan was hoisted and did not rest on the ground. While plaintiff and other boys were playing on and about the bulldozer, the pan fell, injuring plaintiff. The contractor knew that the children were playing there. Was he guilty of such wanton negligence as to make him liable in damages?*

THE ANSWER: No. (Brown v. Bone, 68 S. E. 2d 190, decided by the Georgia Court of Appeals, Division No. 2.)

This decision may be useful to some contractor's attorney in the defense of a similar suit. But the writer doubts that all courts, or even most courts, would reach the same conclusion. When it is known, or ought to be known, that children are apt to play with a machine, it would seem to be wiser and more humane to insure against their being injured by securing the moving parts of machinery dangerous to them.

Subcontractors Not Named: Contract Award Was Invalid

THE PROBLEM: *A Delaware statute required bidders on public building projects to name their subcontractors. The lowest bidder omitted some names and set out others in the alternative. Could a taxpayer maintain suit to enjoin award of the contract to that bidder?*

THE ANSWER: Yes. (Haddock v. Board of Public Education, 84 Atl. 2d 157, decided by the Delaware Court of Chancery.)

The court said: Under the wording of the statute, failure to comply with

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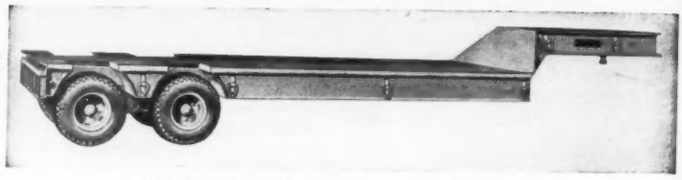

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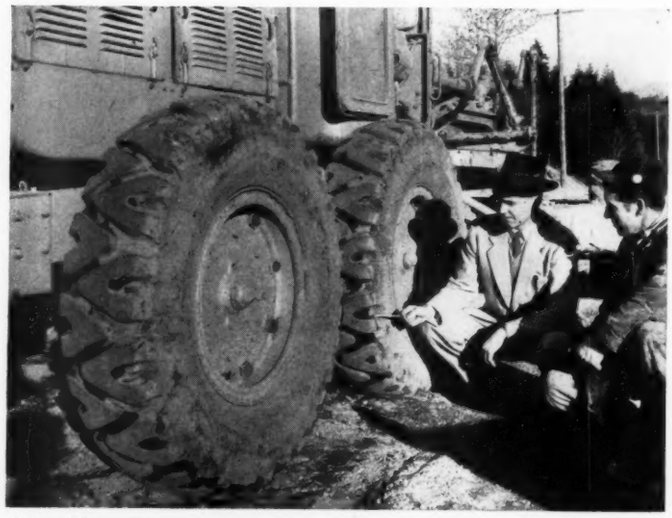

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(Continued from preceding page)

it—its substance was set forth in the bidding instructions—was vital, and not a mere irregularity. The omission could not be cured by naming the subcontractors after the bids were opened. The fact that no taxpayer would suffer loss through acceptance of the lowest bid (as against acceptance of the next lowest bid, which was accompanied by the required information as to subcontractors) did not bar plaintiff from suing.

Ordinarily as a practical matter, public interest in such matters can only be safeguarded by a taxpayer's suit. As declared by a Pennsylvania court: Taxpayers have a right to demand compliance with statutory requirements concerning the award of contracts for public work, regardless of whether direct money loss is involved.

Who Employed Operator Of a Hired Bulldozer?

THE PROBLEM: *The owner of premises hired a bulldozer with an operator to clear land. The operator negligently caused a tree to fall on a house. The owner of the bulldozer, general employer of the operator, sent no one to supervise the work. The owner of the premises directed the operator as to the areas to be cleared, but did not instruct him as to operation of the bulldozer. Was the land-owner the operator's employer in such sense as to relieve the owner of the bulldozer from liability for the damage?*

THE ANSWER: No. (Hodge v. McGuire, 69 S. E. 2d 227, decided by the North Carolina Supreme Court.)

The owner of the premises had requested that that particular operator be sent with the bulldozer. The court said this was some evidence to be considered in deciding whether or not the operator became his employee for the time being, but that it was not conclusive on that point.

Nor was it important that defendant, owner of the bulldozer, sent no one to supervise the operator. That did not show that the operator was placed under the landowner's supervision, but only that defendant regarded the operator as capable enough to need no supervision.

Liability on Forged Endorsement of Check

THE PROBLEM: *A firm's bookkeeper made false entries showing receipt of materials from regular suppliers; secured official signatures on checks to cover the charges; and collected the proceeds by forging signatures of the payees. Was the firm liable to banks cashing the checks?*

THE ANSWER: Yes. (Orton Crane & Shovel Co. v. Federal Reserve Bank, Chicago, 102 N. E. 2d 663, decided by the Appellate Court of Illinois, First District.)

The decision rested upon the ground that the checks were technically "bearer" checks under the statutes of Illinois. The court seems to have been influenced by the fact that the firm's officer signed the checks in reliance upon the bookkeeper's remittance slip, without checking to determine whether the materials for which the checks were issued had actually been received.

Right to Interest

THE PROBLEM: *A state contractor's work was accepted 17 months before final estimate was issued. Because the contractor was pressing or intended to press a claim for damages arising out of performance of the contract, he failed to sign a release of all claims against the State. Was the State therefore entitled to withhold interest on the amount due?*

THE ANSWER: No. (Rusciano & Son Corp. v. State, 105 N. Y. Supp. 2d 719, decided by the New York Supreme Court, Appellate Division, Third Department.

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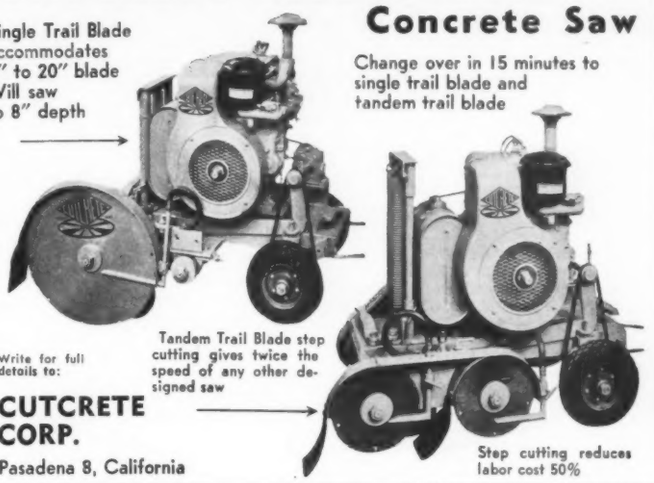

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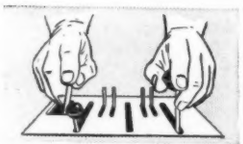

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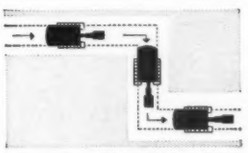

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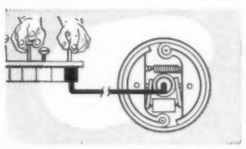

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Unusual Rebuilding Of Trestle Bridges

Overhead Detour "Flying Bridge"; Staggering of New Bents; And Widening of Steel-Truss-Span Bridge Are Features

By
ARDIS WHITE, Assistant Professor, Department of Civil Engineering, University of Southern California
and EDWARD F. MADDOX, Resident Engineer, Texas Highway Department

• RECENTLY four timber-trestle bridges on U. S. 78 near Lavor, in Collin County, were completely rebuilt by the Texas Highway Department. A movable overhead detour bridge was a feature of the job.

Three of the bridges were entirely of timber, but the one over the East Fork of the Trinity River consisted of a 70-foot steel truss span and a 36-foot I-beam span, with timber approaches. Total length of the bridges was 1,985 feet. Their superstructure rested on four-pile bents driven for 15-foot spans. Decking was of 2 x 10-inch bridge planks, resting on 3 x 12-inch stringers, with a clear roadway of 16 feet. The stringers rested on a 12 x 12-inch wooden cap held in position by a single drift pin in each pile.

The new treated-timber bridges have the following main features: 15-foot spans; an asphaltic-concrete surface crown on 2 x 4-inch decking planks on edge; 4 x 14-inch stringers; treated-timber piling; and reinforced-concrete caps and footings. Their clear roadway is 22 feet. Each new bent consists of four piles, set on 6-foot 8-inch centers normal to the roadway, resting on individual concrete footings and held in position with both sash and sway bracing; and an RC cap 1½ feet x 2 feet x 25 feet 8 inches. Eye-bolt anchors in the cap hold the stringers in place.

New Bents Staggered With Old

Hand excavation for the new footings was done with the new bents located midway between the old ones so that the work could proceed without disturbing the old bridge. After excavations for a number of new bents were completed, piles were set to line and grade. The piles were suspended on braces which rested on the edge of the excavation, and the pile footings were poured. Concrete was brought by dump trucks from a central mixing plant and discharged into a mixing box on the bridge. The concrete was then remixed by hand, and thrown into an 8-inch tremie leading to the footing holes. Only one footing was poured at a time, and while the concrete crew worked on one side of the bridge, traffic passed by on the other side over half-length decking planks.

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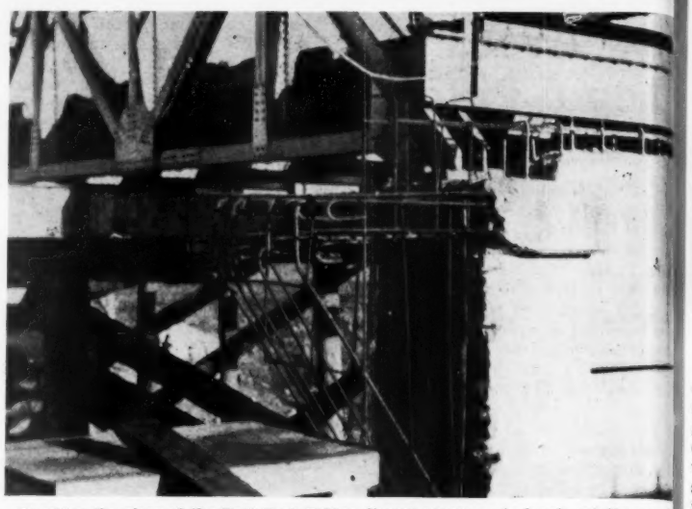

To widen the piers of the East Fork Bridge, it was necessary to break out the concrete. After that, splice steel was welded to the old reinforcing steel, and the haunches formed and poured. The picture shows the extra steel welded in place.

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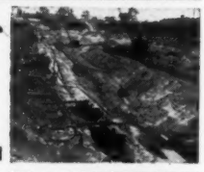

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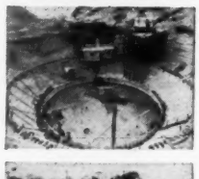

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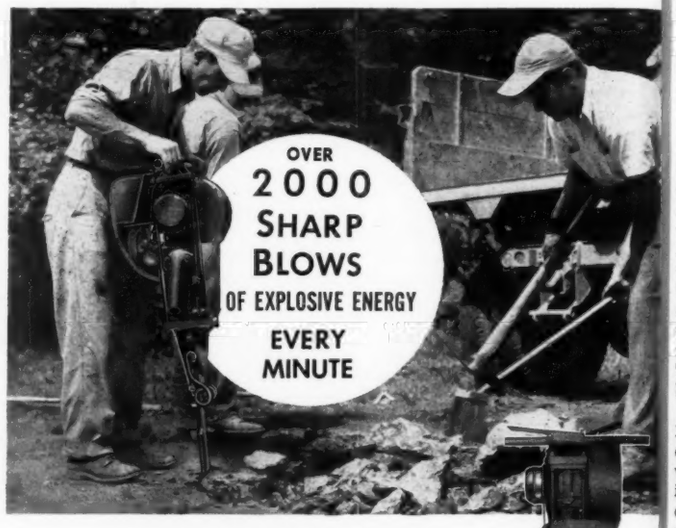

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The overhead-detour "flying bridge" at the end span of the Pilot Grove Creek Bridge—one of four completely rebuilt by the Texas Highway Department.

When the footings had set up properly, concrete cap forms were built on the tops of the four-pile bents. The grade for the tops of the new caps was established about an inch below the tops of the old caps to permit proper setting of the new cap forms, and curing and finishing the concrete. When the forms were ready and the reinforcing steel in place, the concrete caps were poured in the same way as the footings, except that the concrete was shoveled directly into the cap form after remixing. As a rule, both caps and footings were poured in groups of three or more to get efficient use of concrete crews and equipment.

Detour Was Overhead

To build a detour beside each of the old bridges was impractical; moreover, traffic was to be interrupted only momentarily. Therefore a fixed detour was built only at the 414-foot East Fork Bridge. This was necessary because to widen the 70-foot steel-truss span there, the old steel bridge had to be cut lengthwise. The detour used for the other three bridges was perhaps the most interesting feature of the project. This was the overhead detour "flying bridge".

Its main structure consisted of four 18-inch 56-pound I-beams with a span of 40 feet, resting on 12 x 18-inch wooden caps, supported by half-bearings resting on 12-inch steel pipe rollers. The steel rollers and half-bearings were used so that the direction of movement of the bridge could be changed by jacking up the bridge and sliding the rollers one way or the other. Minimum clearance under the bridge was 3 feet; the maximum clearance, between the I-beam stringers, was 4 feet 6 inches. Two 22-foot ramps were made of wood stringers and flooring removed from the old bridges. The final inside clearance was about 9 feet. The overhead detour bridge when finished had a total length of about 90 feet and a total weight of about 14 tons. It was completely assembled near the east end of Pilot Grove Creek Bridge, and then pulled out onto this bridge until the front roller was just past the second old bent. Traffic then passed over the detour bridge.

Moving the overhead detour was a tedious process at first, but after a few trials the pipe rollers were smoothed by wear and moving the structure became much easier. Oil and graphite were used on the rollers and a block and tackle made it possible to move the detour structure with one truck. The fixed line of the tackle was anchored to caps of the old bridges or large trees along the right-of-way during movement of the detour bridge. Movement was interrupted at reasonably short intervals to allow accumulated traffic to pass.

Due to staggering of the new bents with reference to the old, one new bent was driven at each end of the old bridges, and thus the new bridges were one span longer than the old ones. The end bents were driven and caps poured ahead of the overhead detour, and the end spans were built exactly as the interior spans were. When the overhead detour was in place, wrecking of the old decking and stringers under it began; the old decking had been loosened before moving the detour bridge forward each time. After removal of the old flooring, stringers, and caps, the new stringers were put in place and the 2 x 4-inch decking nailed with staggered nailing and joints; the detour bridge was then pulled forward again. The railing crew usually followed about 200 feet behind.

Widening East Fork Bridge

As a first step in widening the 70-

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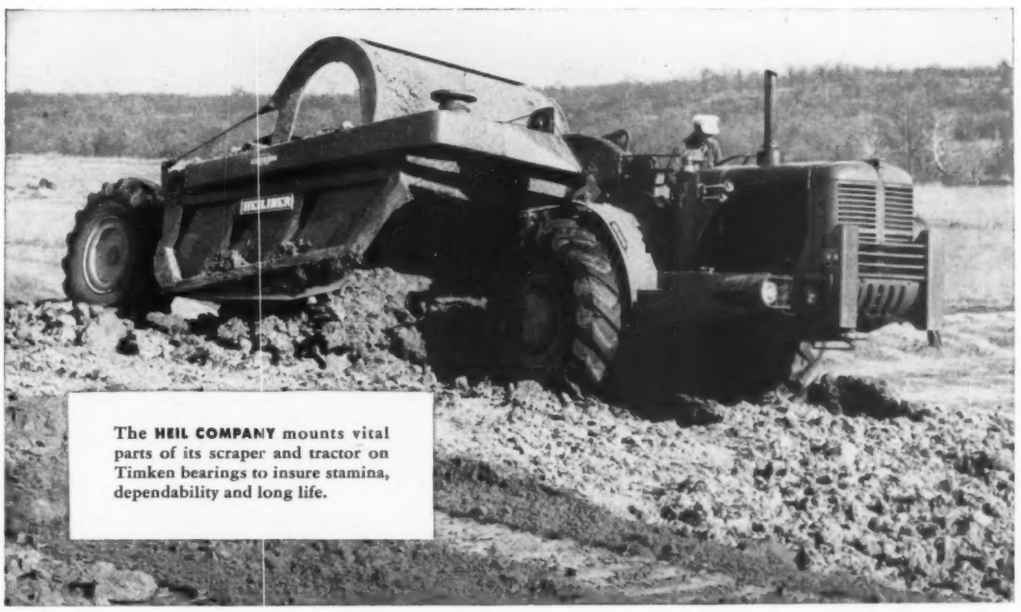
One of the ways Heil insures rugged dependability in its tractor and scraper is by mounting vital parts on Timken® tapered roller bearings. In the tractor's differential and on its pinion shaft and engine shaft, Timken bearings insure accurate gear meshing, reduce wear. That's because the tapered construction of Timken bearings enables them to take radial and thrust loads in any combination. Shafts are held in accurate alignment, a smooth flow of power is insured.

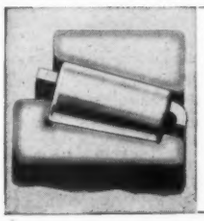
On both the tractor and scraper wheels Timken bearings are more than a match for heavy shock loads. Line contact between rollers and races in Timken bearings provides load carrying capacity to spare. And with Timken bearings on the scraper cable winch sheaves, cable wear is minimized because sheaves turn freely. Timken bearings make closures more effective because they keep housing and shafts concentric. Lubricant stays in—dirt stays out.

No other bearing can give you all the advantages you get with Timken bearings. Make sure you have them in the equipment you buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



The **HEIL COMPANY** mounts vital parts of its scraper and tractor on Timken bearings to insure stamina, dependability and long life.



GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ○ THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST ○ LOADS OR ANY COMBINATION

Unusual Rebuilding Of Trestle Bridges

(Continued from preceding page)

foot steel-truss-span bridge at East Fork, the concrete was broken out in order to widen the piers. Splice steel was then welded to the old reinforcing steel, and the haunches formed and poured. When this had been done, a strip of concrete paving was broken out down the center of the bridge slab, so that the floor beams could be cut and the steel trusses jacked out to new positions on the newly poured haunches. The floor beams were cut as soon as the falsework was completed to support part of the dead weight of the bridge. This falsework consisted of caps from the old bridges and I-beams taken from the I-beam span adjacent to the truss span. The top of the falsework rested on untreated-timber piling driven several weeks before.

The two halves of the bridge were then pushed apart by jacks to the proper position on the haunches. The splicing floor beams were welded in place, the ends of the trusses jacked up, and the bearing plates placed. These bearing plates and ends of the trusses were fixed with anchor bolts placed in holes drilled in the pier. Slab forms and the necessary steel were placed, and the center strip of the concrete slab poured. When this concrete had cured properly the bridge was opened to traffic.

Surfacing the bridge floors with asphalt was the final step in reconstruction and was carried out in a conventional manner.

Motorized Head Pulley

A motorized head pulley for conveyors is made by Yuba Mfg. Co., Balfour Bldg., 351 California St., San Francisco 4, Calif. The Schrock is a fabricated steel drum, normalized to relieve stresses, with self-contained electric motor and reduction gears. A torque arm at one end of the drum is attached to the conveyor frame to prevent the motor from rotating inside the drum as it drives the pulley.

Here is a 10-hp Schrock motorized head pulley installed on a gravel conveyor.

Leads to the motor enter the head pulley through a hollow conduit passing through the drum end bell and bearing. The motor and head pulley are cooled and ventilated by holes in the drum. Units are made from 5 to 75 hp with pulley diameters ranging from 16 to 48 inches.

The motorized heads can be used on both belt and bucket conveyors. The company points out that since all moving parts are enclosed in the drum, no sprockets, chains, or V-belts are required.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 348.

Power-Operated Valve

A power-operated valve for air, oil and water operation, with option of finger, cam, toe, or solenoid pilot controls, is made by Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif. Available in 6 sizes, it is used when hand or foot-operated valves cannot be used. It is applicable on work involving automatic operation, reciprocating service, and where a failure of electric power or line pressure must reverse the valve.

It is essentially a standard four-way valve, but disk rotation is accomplished by means of a piston moved by the operating fluid pressure of the main line and controlled by small pilot valves suitably located and actuated. Applying pressure through the pilot on one end of the piston forces it to move ahead and rotates the valve disk to forward position. Applying pressure on the opposite end moves the piston back and rotates the disk to reverse position.

Further information may be secured from the company by requesting Bulletin 1000. Or use the Request Card at page 16. Circle No. 289.

Truck Firm Comes of Age

Marmon-Herrington Co., Inc., Indianapolis, Ind., manufacturer of heavy-duty all-wheel-drive trucks, is celebrating its 21st anniversary this year. Founded in 1931 to fill the need for multiple-drive vehicles that would operate reliably in difficult off-road conditions such as mud, sand, and snow and in deep ditches and on steep grades, the company has grown rapidly. It enters its 22nd year with its volume of business at the highest level in the company's peacetime history.

FOR MAXIMUM PERFORMANCE

DIAMOND ROLLER CHAINS

Osgood shovel with Diamond Roller Chain on crowd drive. Main drive chains carry power from the engine to reversing shaft, powering swing, travel, boom hoist and main hoisting shafts.

The men who build and operate first-class equipment know that every component part must be of the same highest quality to obtain maximum performance and operating economy.

Diamond Roller Chains are chosen for original equipment and specified for replacement because they provide the long-life durability, and on-the-job economy that is both a credit to the manufacturer and an asset to the contractor.

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Dept. 7 — 12% more power, 10 lbs. lighter weight

LOMBARD GOVERNOR CORP.
ASHLAND, MASSACHUSETTS

With this combination stopwatch and revolution counter, one man can check the speed of motors, machinery, ratching shafts, etc.

New Device Records Time and Revolutions

A combination stopwatch and revolution counter for checking motor and machinery speeds is sold by Montgomery & Co., Inc., 53 Park Place, New York 7, N. Y. The unit makes it possible for one man to record both the time and the number of revolutions.

The operator presses the rubber tip lightly against the revolving shaft, causing the counter to idle. A harder press starts the counter and stopwatch simultaneously. The unit has a solid brass housing and comes in a velvet-lined leatherette case.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 333.

New Plastic Piping

A plastic piping said to be resistant to many solvents and to be unaffected by mineral acids, salts, and alkalies at temperatures up to 150 degrees F is announced by Munray Products, Inc., 12400 Crossburn Ave., Cleveland 11, Ohio. According to the company the pipe is also unaffected by temperatures as low as minus 50 degrees F; it retains all its properties through repeated freezing and thawing; and it is completely free from electrolytic corrosion. It can be used for sewage and acid drainage, for fume piping, and for corrosives. Its electrical properties fit it for use as conduit.

Cyclothene pipe is made in sizes from ½ to 6 inches. It is furnished in stock lengths of 25 feet in 4-inch or larger pipe, 125-foot coils for 3-inch pipe, 250-foot coils for 2-inch pipe, and up to 400-foot coils in smaller sizes. It is connected with knurled and insert connectors clamped with stainless-steel bands. A standard pipe-thread adapter is also available where connection to other equipment is desired. Cyclothene can be furnished with welded-on flanges in specific lengths. L's, T's and Y's can be fabricated, as needed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 251.

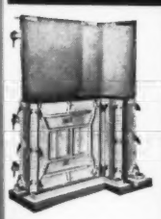
Leaflet on Greasing Unit

A leaflet on a portable high-pressure greasing unit has been issued by G&T Industries, Inc., 1428 Barwise, Wichita, Kans. The Greasemaster attaches to either a 6 or a 12-volt battery. It comes with 25 feet of hose and weighs about 50 pounds. A cam-driven plunger-type pump with one self-priming and self-lubricating check valve pumps all fluid and semifluid greases.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 267.

The latest addition to the Rex line of mixers, caught in operation at Burlington, N. C., during improvement work on the Celanese Corp. of America plant. B. F. Kirkpatrick & Son owns this 5½-yard Moto-Mixer.

Save manpower time and material



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Can you do this with your diesels?

Within just 40 minutes you can remove a cylinder assembly — replace it with a complete new one — and have your P&H Diesel back in service.

No other diesel offers you such amazing speed and simplicity — such protection against costly lay-ups. Think what it can mean to you in time and cost savings — in simpler parts stocks. Where necessary, you can take an assembly from one engine to another . . . good reason in itself for standardizing on P&H Diesels.

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Russians Have Copy Of American Tractor

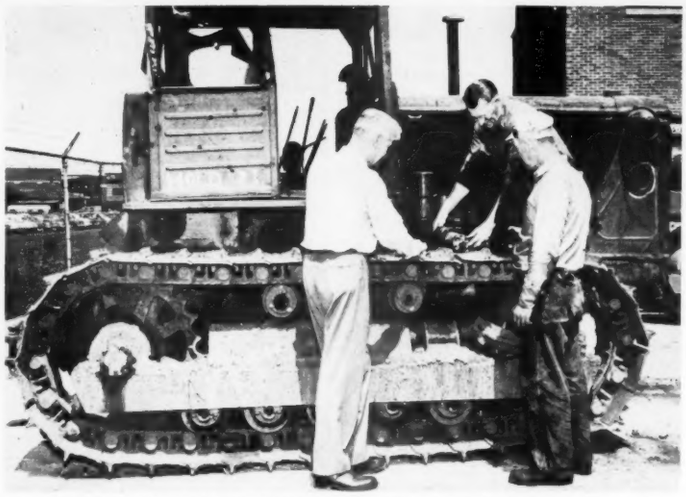
The capture of two Red tractors in Korea has disclosed the fact that the Russians have the engineering know-how—and the materials—to reproduce American equipment probably obtained through Lend-Lease about ten years ago.

The two tractors, which were in a battered condition when captured, are metric copies of Model D7, the second-largest track-type tractor manufactured by Caterpillar Tractor Co., Peoria, Ill. The D7's illegitimate brother—born the wrong side of the blanket, or Curtain—is called the Stalinetz 80. Taking into account the machine tools and raw materials available to the Russians, it is an exact copy of the U. S. tractor, and its good engineering quality has surprised Caterpillar experts who examined the captives at the request of the Army Corps of Engineers.

According to J. M. Davies, Caterpillar's Research Director, the following sober facts emerge from the examination: 1. The Reds designed the machine to fit more convenient metric dimensions—no mean engineering feat. 2. They attached no importance to appearance, as the parts are rough on the outside, but gave careful attention to parts finish and close tolerance where needed. The antifriction bearings are very good. 3. Although available raw materials differ slightly, metallurgy on the Red copy is also very good. 4. The tractors were probably produced on an assembly-line system similar to Caterpillar's.

Mr. Davies' comment on the metric dimensioning was: "Considering all the parts which had to be changed, and also considering the fact that the tolerances and fits of each of these parts had to be changed to metric standards, this is an achievement reflecting no slight engineering skill." As to part interchangeability, the fact that the Caterpillar tests were run on a Russian diesel tractor engine assembled from parts from two separate machines, proves that the Russians understand this principle. Also, "The Russians know when to make parts hard and where to make them tough", said Mr. Davies. While hardness and toughness of Red and American parts are about the same, Russian shop practices seem to be quite different. This is shown by the rough finishes, except where close tolerances and good finishes are essential for satisfactory operation.

In effect, the Red models incorporate all the basic knowledge and experience Caterpillar has applied to its track-type diesel tractors. The fact that the complete tractor in operation would probably be more noisy and have a slightly shorter life than the Caterpillar machine does not keep the experts from feeling that the Russian machine is one which would give satisfactory operation.



J. M. Davies (left), Director of Research at Caterpillar Tractor Co., Peoria, Ill., with Mechanics Harold Dahl and Frederick A. Kaiser, examines the oil filter on the Stalinetz 80, a metric copy of Caterpillar's D7 tractor.

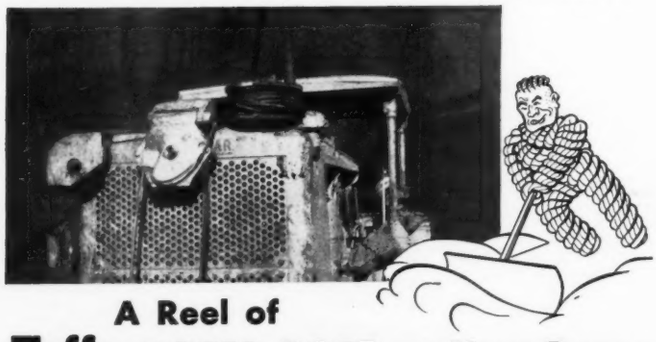
Death of Earl C. Williamson

Earl C. Williamson, President of Fram Florida, Inc., Jacksonville, Fla., died on May 29. Mr. Williamson was also Director and Vice President in Charge of Manufacturing of Fram Corp., Providence, R. I., manufacturers of engine oil filters. He had been with the company for 8 years.

Now...a New Tuffy

Joins the Famous Union Wire Family To Help You

CUT CONSTRUCTION COSTS Even More!



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Can Save UP to 75%!

HERE'S HOW:—Until now, it has been necessary to throw away 40' to 50' of good rope whenever 10 feet or so have become crushed or cut on the drum. *Now, you can stop this costly waste!* Simply mount a reel of Tuffy Dozer Rope just back of the wedge socket . . . feed just enough new rope through the socket to *replace only the part that is damaged!* Tuffy ½" Dozer Rope is now furnished in 150' reels. Write today for simple details on how to mount Tuffy on your dozers.

These Tuffys Are TOPS in the Construction Field

Tuffy DRAGLINES Built tough—for extra flexibility, maximum abrasive resistance, easy handling, greater efficiency at high speeds or low. Easy to order—just give length, diameter and the name, "Tuffy"!

Tuffy SCRAPER ROPE Reduces material handling cost through extra yardage of dirt moved, and more days of service. And all you need to order is—Length, Diameter and "Tuffy!"

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Move 'em faster between jobs . . .

get extra production with MILLER Tilt-Top!

Where large flat bed trailers are usually too cumbersome for lighter hauling . . . a MILLER Tilt-Top is always handy for moving slow machines from one operation to another. Self-moving equipment practically loads itself onto tilted platform and can be towed to the next operation in jig time . . . cutting non-productive time for operator and equipment to a minimum. Standard platform is 14' x 8' optional 16' available.

MODEL "B" 10 TON $1175. The following equipment is optional and extra: hydraulic tilt control, two speed winch, electric brakes.

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MILLER Tilt-Top TRAILER research engineers

WELLMAN Williams Type

PERFORATED DRAGLINE BUCKET

speeds the wet jobs

• You get big loads fast with this Wellman Perforated Dragline Bucket because excess water goes out while gravel stays in on jobs such as illustrated.

Built of special alloy steel—all welded for strength plus light weight. You can work faster with less maintenance with Wellman dragline buckets.

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THE WELLMAN ENGINEERING COMPANY

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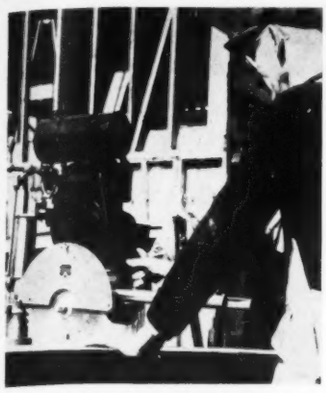


A gasoline engine powers this radial-arm saw, the Mitermaster.

New Radial-Arm Saw With Gasoline Power

A radial-arm saw powered by a gasoline engine is being offered by R. W. Hendrick Co., 11 Selman St., Marblehead, Mass. A complete tool equipped with a raising and lowering device, the Mitermaster can do mitering, beveling, or compound mitering. It takes a 10-inch blade and cuts 3⅞ inches deep with a 15-inch travel. The 55-pound unit takes a 13/16-inch dado head.

On special order, extra-long rails can be obtained with double yoke and column assembly at each end for cutting sheets of 4 x 8 plywood and other material.

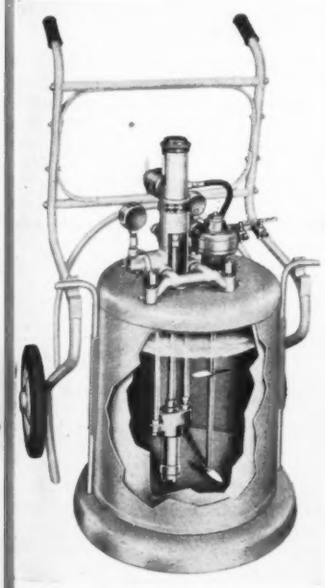
Further information may be secured from the company. Or use the Request Card at page 16. Circle. No. 318.

Portable Supply Pump For Paint Spray Gun

A new portable heavy-duty supply pump for paint spray guns has been announced by Gray Co., Inc., 1012 Sibley St., Minneapolis 13, Minn. It works directly from 5 or 10-gallon original containers.

The air-operated double-action reciprocating pump is operated by one man and rides on large rubber-tired wheels. For stationary operation the truck disengages from the trunnion arms. A separate air-operated dual-bladed agitator keeps the materials mixed. Its aluminum blades are adjustable to any depth. Since no air pressure is exerted on the material, aeration is reduced to a minimum.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 345.

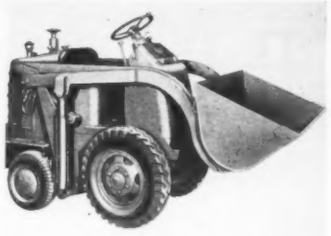


This supply pump for paint spray guns —a heavy-duty Paintmaster works directly from 5 or 10-gallon original containers. Gray Co. makes it.

New Front-End Loader With Rocking Feature

A new ½ to ⅝-yard-capacity front-end loader uses a patented loading method of rocking, scooping, and lifting the bucket from the ground. It is made by Transmission & Gear Co., 10421 Haggerty, Dearborn, Mich. Powered by a Ford engine, the TL-50 Transo Load Master features a high dumping position, full visibility for the operator regardless of bucket position, an over-all wheelbase of 44 inches, and the complete elimination of an engine clutch.

A heavy-duty master clutch is located in the front end of the integral transmission and driving-axle unit and allows easy maneuvering in all directions and at all travel speeds. The clutch can be replaced in a half hour, claims the manufacturer.



The bucket of the TI-50 Transo Load Master is "rocked" into the load for greater efficiency.

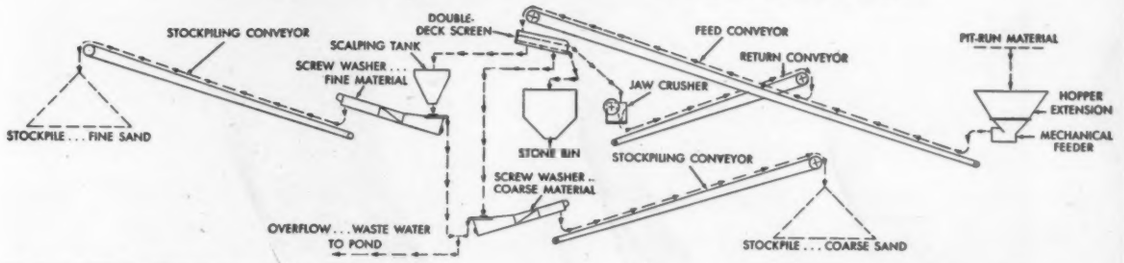
The planetary-type reverse transmission has the cushioning effect of spring-loaded clutches running in oil, which reduces reversing time by 95 per cent. This feature results in faster forward-to-reverse travel with a minimum of shifting and adds to safety and operator comfort.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 309.

J. P. Williams for Centric

Jack P. Williams is a recently appointed midwest factory representative of Centric Clutch Co., Woodbridge, N. J. Mr. Williams, who has many years' experience in industrial sales representation in the midwest, makes his headquarters at 20 N. Wacker Drive, Chicago, Ill.

Engineered for Maximum Production Per Dollar of Investment



"Adding washing equipment to what was already a highly efficient crushing and screening plant has made my Austin-Western set-up DOUBLY SUCCESSFUL and PROFITABLE."
Edward Schneider, Elgin, Illinois

Close-up of screw washer for coarse material

Pit-run gravel is conveyed to a screen to which water has been piped, where stone already down to size is removed and spouted to the bin. Oversize goes to a jaw crusher, and from there is returned by conveyor to the screen, closing the circuit. Coarse sand is spouted to a screw washer where, through controlled water turbulence, the coarser, heavier material, washed clean, settles to the bottom and is taken out by the screw. The finer sand, together with silt and debris, is held in suspension, and goes with the water to a large settling tank where the sand settles to the bottom. Then, with some of the water, it goes to the final washer where the fine sand is again thoroughly cleaned. As it settles, it is taken out by screw conveyor. Washed material, from which silt, clay and vegetation have been removed, always brings TOP prices!

Whatever your requirement, there's an Austin-Western plant to meet it . . . a plant that means MORE ROCK for LESS MONEY. Why not talk things over with our engineering department?

Return conveyor provides closed-circuit operation

View of settling tank and screw washer for fine mater

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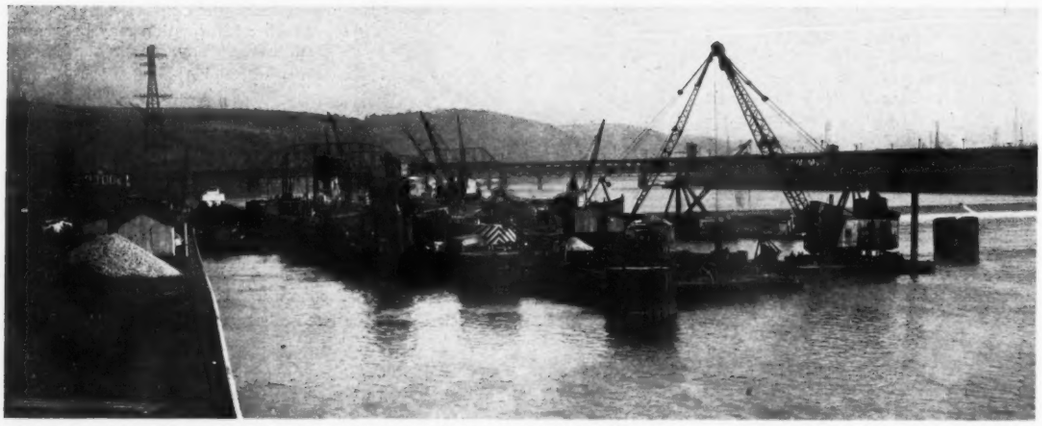
BALDWIN BLH LIMA-HAMILTON

SINCE 1859—BUILDERS OF CONSTRUCTION EQUIPMENT

Locks on Monongahela Rebuilt



This early view upstream shows work in progress on the riverward lock, while barges are locked through the old land chamber.

By last spring Dravo was hard at work on the landward lock, the second phase of construction. At left is the old lock chamber partly demolished. Beyond is the new middle wall of the two locks, the new river wall, and the floodway bulkhead structure.

Looking downstream we see the floodway bulkhead, this time on the left, and in the foreground the skin cofferdam of sheet piling driven on the land side of the old landward wall. Notice the heavy internal cross bracing. *Corps of Engineers Photos*

Any Problems? Lack of Space For Working; River Traffic Has to Be Maintained; Land Wall Is Unstable

By WILLIAM H. QUIRK,
Editor

• ONE of the most important river and harbor improvements currently under way in this country is the reconstruction of Locks No. 2 on the Monongahela River at Braddock, Pa. At this point in the river, only 11.2 miles above the apex of the Golden Triangle at Pittsburgh, a low concrete dam necessitates an 8.7-foot lift between the 718.7 elevation of the upstream pool and the 710.0 elevation of the downstream pool. The first lock and dam was built over a hundred years ago between 1839 and 1841 by private interests. It was subsequently purchased by the Government in 1897, and between 1902 and 1906 the U. S. Army Corps of Engineers built a new lock and dam along the right bank of the river, with the Dravo Corp. of Pittsburgh as the contractor.

The Dravo-built structure had two locks—each 56 feet wide x 360 feet long. In nearly half a century of their operation, river traffic had so increased that a serious bottleneck of tow barges had developed in this heavily industrialized coal and iron region. The old concrete walls were also deteriorating, the air-operated gates and mechanical equipment were outmoded, and the foundations were a cause of concern.

Accordingly the Pittsburgh District Corps of Engineers decided to replace the obsolete twin locks with a new structure to be built in two phases under separate contracts. Dravo Corp., with low bids in each instance, was awarded both jobs. The first phase included the construction of a new riverward lock chamber, 56 x 360 feet. This initial contract got under way in December, 1948, and the structure was completed for use by river traffic in June, 1951, at a cost of approximately $7,263,000.

Construction on the second phase, consisting of a new landward lock chamber, 110 x 720 feet, began as soon as the riverward lock was in operation. Estimated cost is $7,967,667, and the project is expected to be finished the latter part of 1953, although the steel shortage may cause some revision in the completion date.

Site Limitations

In 1758 when the French and Indians cut down Gen. Edward Braddock with his American-British forces at this location, there was only a wilderness along the river bank. Now the old battlefield site is occupied by the Edgar Thomson Works of U. S. Steel Co., and the tracks of the Pittsburgh & Lake Erie Railroad skirt the shoreline of the Monongahela. The old lock had little more than a toehold on the land, but since no suitable alternate site was available, the new structure had to be practically superimposed on the existing one.

Working space was just about non-existent, and the contractor was forced to rent from the steel company some land along the river, about ½ mile downstream from the site, for use as a yard. Here he set up his equipment and materials storage facilities, form platform, and carpenter shop. Supplies were delivered over water, for the most part, but the railroad siding of the P. & L. E. was also available. Final transfer to the site was made by tows and barges.

During the second-phase construc-

(Continued on next page)

C. & E. M. Photos

One of the main items in the second-phase contract is this caisson containing seven 10-foot-diameter dredging wells. The view at left shows the outside forming. At right, inside the caisson, the third lift of concrete has been placed. The caisson will be sunk 50 feet and form the upstream anchor for the cofferdam.

tion, river traffic is maintained through the recently completed riverward lock. While the latter was being built, boats were locked through the old land chamber. This river traffic reaches tremendous proportions. In an average month there is more coal, steel, and other bulk tonnage transported on the three rivers in the Pittsburgh area—Allegheny, Monongahela, and Ohio—than on the Suez and Panama canals combined.

Constant protection was also required at the presumably unstable land wall along the river bank, to prevent sliding of the adjacent railroad tracks and any movement of existing structures. Soft plastic clays are prevalent in this area, and a slough cuts across the upstream end of the site adjacent to existing intake and discharge structures. The latter condition was overcome by sinking a 50-foot-deep caisson as the upstream anchor for the cofferdam. At the downstream end, skin cofferdams of sheet piling were driven on the land side of the old landward wall to permit excavation in safety.

Bulkhead Dam

Since the new structure obviously could not encroach on the adjacent land, the increased width extended out into the river. The new land wall is 3½ feet riverward of the old land wall, and

(Continued on next page)

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Locks On Monongahela Are Rebuilt, Enlarged

(Continued from preceding page)

with the wider lock the length of the dam across the river was reduced from 818 to 748 feet. The 70-foot decrease in channel width would be an undesirable feature in times of flood.

Accordingly a floodway bulkhead was built into the first of the two new chambers, just above the upper lock gates. Two pairs of arched piers, rising above the new river and middle walls, support this emergency dam that resembles an overhead garage door. In case of damage to the lock gates, the bulkhead is lowered to prevent loss of the upper pool. In times of flood, when the lock gates cannot be opened against a head of water, the pressure is removed by dropping the bulkhead. The gates are then easily swung open, the bulkhead is lifted, and the flow of water past the fixed dam is thus greatly increased.

While the new riverward lock chamber is 360 feet long, the river wall is 1,308 feet in length and 22 feet wide at the top. The middle wall, also built in the first contract, is 1,050 feet long and 24 feet wide at the top. At the base these walls are 36½ to 44½ feet wide, according to their height. Average height is 60 feet, from the rock on which they are founded at elevation plus or minus 670 to 730.5 elevation at the top of wall. Top of concrete paving in the locks is at elevation 691.25. This slab is 5 feet thick for the first 40 feet at the upper end, 3 feet thick for the next 30 feet, and 1½ feet for the remaining floor of the chamber. Depth of water over the lower and upper sills is 16 feet.

Second-Phase Contract

In the contract for the second phase of the lock project, the work is divided into several principal features. These include: cofferdams; salvage of existing machinery and equipment; demolition of remaining old lock structures; construction of new 110-foot lock; installation of lock gates, valves, operating machinery for the hydraulically controlled mechanism; power and light system; relocation of sewers and manholes at the steel plant; and construction of a protection wall at the plant's high-tension tower.

While the landward lock is 720 feet long, the project has an actual length of 2,437 feet along the river bank. This figure includes a 1,175-foot land wall; a 776-foot upper guide wall; and a 486-foot lower guide wall. From a base width of 42 feet the land wall steps in at different levels, and at the top elevation of 730.5 it is 10 feet wide. Guide walls are 7 feet wide at the top. The land wall, like the middle and river walls adjoining the lock chamber, goes down to rock. The upper guide wall is partly founded on rock and partly supported on cellular steel cofferdam units. Steel bearing piles are driven as a foundation for the downstream guide wall.

Largest single item in the contract is the construction of the cofferdam which was estimated to cost nearly $2,000,000. In the first-stage construction Dravo built the two walls included in the contract by means of a combination cofferdam and caisson method. Caissons were sunk between paralleling rows of steel-sheet-pile cellular-type cofferdams. In the current work the new

(Continued on next page)

C. & E. M. Photo

Along the river bank at the upper end of the Monongahela lock project: the T-7 whirler at left, mixer boat No. 4 at right. Between them is derrick boat No. 23, and behind them is the steel plant.

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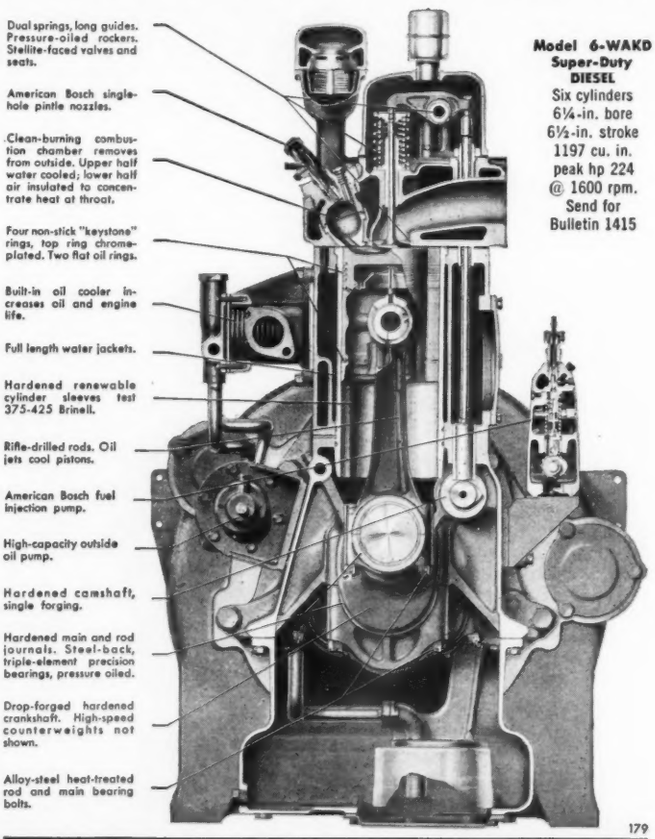

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middle wall serves as part of the river arm of the cofferdam. Other cells are extended up and down stream reaching back to the banks to enclose the work area. This was not done all at once, but only as the sequence of operations permitted. At the upper end the cells are 54 feet in diameter, but downstream smaller cells with 44-foot diameters were used.

Floating rigs drove the sheet-pile cells to rock, and their interiors were then stabilized with sand and gravel fill. Piling is 50 to 60 feet long. In the upper pool the top of cofferdam is at elevation 730.5, while in the lower pool it stands at 727 and 720. Until the work advanced to a point where the cofferdam closure was called for, the contractor made use of the old landward lock for passing his rigs from one end of the job to the other. The dam really cuts the project in two, with separate work areas above and below the structure.

Sinking a Caisson

The 50-foot-deep upstream caisson of reinforced concrete was sunk in the river bank in five 10-foot lifts through mud, sand, and gravel until it finally reached a rock stratum. The caisson had five sides, four sides measuring about 40 feet and one side measuring about 5 feet; it contained seven 10-foot-diameter dredging wells with a jet hole at the center. The outsides of the caisson and the wells were formed with 2 x 6 tongue and groove sheathing. At the bottom of the caisson is a 6-foot-high work chamber, flaring out at the sides to a cutting edge made up of half sections of 14-inch WF 103-pound steel beams.

After each 10-foot lift of concrete, the caisson was lowered by excavating the material through the wells with a clamshell. After sinking the last lift the top of the caisson was down to ground level. In the wells and working chamber the bottom 10 feet was sealed off with tremie concrete, and the rest of the depth was filled in with sand and gravel. The caisson will become part of the general cofferdam protection, and carry a shallow earth dam over its top.

Settling Basin

Another early operation in the second-phase contract was the construction of a settling basin for the steel mill. Located behind or on the land side of the new land wall, the basin extends downstream in back of the lower guide wall. It is 190 feet long, and its battered concrete walls decrease in width from 52 feet at the top to 25 feet at the bottom. Skin cofferdams of steel sheet piling were driven around the perimeter of the basin in preparation for the excavation and concreting. Internal cross bracing gave the cofferdam the necessary strength and rigidity.

C. & E. M. Photo

The S-8 whirler picks up a length of piling for the skin cofferdam at the lower end of the settling basin.

The skin-type coffer was built with 35-foot lengths of Carnegie-Illinois M-116 steel sheet piling, driven with a McKiernan-Terry 9-B-3 hammer. The piles were set in rows by the S-8, a Dravo whirler that also handled the driving hammer. This electric-powered steel-base rig operated over 14-foot-gage crane rails that were laid behind the old land wall.

Once the lower guide-wall skin cofferdam was in place along the toe of slope of the embankment supporting the tracks and sundry mill facilities, the demolition of the old land wall got under way. The old 25-foot-high gravity-type wall was built of plain concrete, and was supported on timber piles that were driven to within about 15 feet of bedrock. The floor of the old lock, a 5½-foot plain-concrete mat, was

(Continued on next page, col. 3)

C. & E. M. Photo

"Doc" Daugherty, left, is Resident Engineer for the Corps of Engineers. R. A. Thompson is Superintendent for the Dravo Corp.

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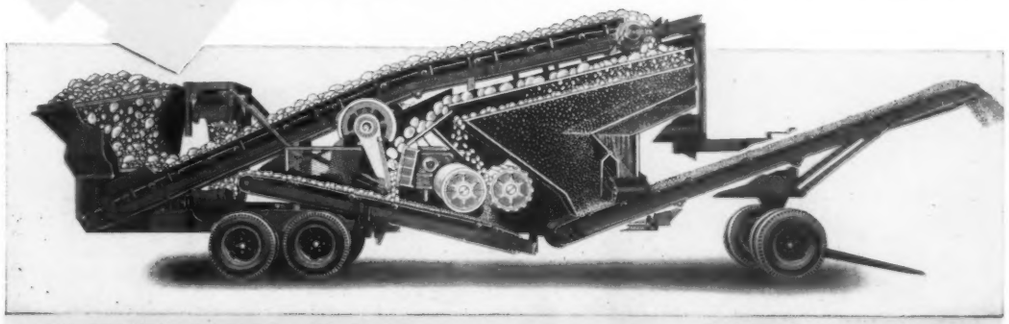

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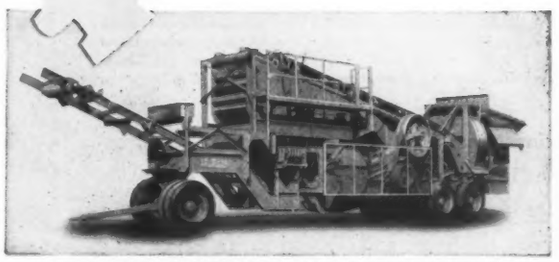

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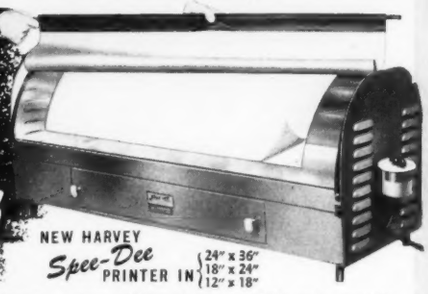

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Locks On Monongahela Are Rebuilt, Enlarged

(Continued from preceding page)

founded on similar piling.

Blast holes were drilled 3 feet apart in two rows in the top of the old wall with an Ingersoll-Rand FM2 wagon drill. The holes were charged with Du Pont dynamite, and the wall was razed in two lifts of about 12½ feet each.

Equipment

Bidding had been light on this tough and tricky river project, for not many contractors have the know-how, the patience, or the resources to stick with a long-drawn-out job of this kind. Neither have they the necessary plant and equipment for tackling work of this type. Dravo assembled at the site a diversified array of land and water equipment, with most of the big rigs designed and built by the contractor himself.

In the early stages of contract 2, two steel-hull coal-burning derrick boats—DB-21 and DB-23—were on hand. With standard 80-foot booms, DB-21 has a lifting capacity of 30 tons at a 35-foot radius, while DB-23 has a 40-ton capacity at a 40-foot radius. At times DB-23 worked with 115 feet of stick. Besides the S-8 whirler, there were also the S-1, S-15, T-7, and T-16. The steel-base S-1 with a standard 75-foot boom has a 15-ton capacity at 35-foot radius; it was mounted on a barge and served as a derrick boat.

T-7 and T-16, on timbers, worked from the top of the cofferdam. These rigs, along with S-1 and S-8, have similar capacities, and operate as gantries or from a set position. S-15, steel-base and electrically driven, was assigned to the yard. With a 65-foot boom it has a 12½-ton capacity at a 35-foot radius. These Dravo rigs handle buckets from 1½ up to 4-yard size. Some excavation in back of the old land wall was done with a Manitowoc Speedcrane equipped with a 2½-yard drag bucket.

Another floating craft for materials handling was a barge with a stiffleg derrick and a 50-foot boom. Eventually the contractor expects to have in service four floating rigs, chiefly for cofferdam construction, and a total of seven whirler cranes. Most of these are electric-driven, with lines from the rigs tapping power sources on shore. Floating equipment includes a fleet of 12 deck barges for transporting such materials as piling, aggregate, coal, forms, etc.

Material excavated from around the site was loaded into two side-dump scows, holding 266 yards each, and towed ½ mile upstream to a deep point in the river where they were emptied. Job towing was done either with the Dravo-44, a diesel-driven craft, or the rented towboat, M. S. Philo.

Pile driving was done with McKiernan-Terry hammers, of which there were three 9-B-3's and one 10-B-3 on the job. The coal or oil-burning rigs furnished their own steam for driving, but in the case of the electric-driven rigs the driving was done with air. Two stationary compressors supplied air—a Chicago Pneumatic at 1,007 cfm and an Ingersoll-Rand at 733 cfm.

Pumps for unwatering cofferdams and various job uses ranged in size from a pair of American 16-inch pumps down to 2-inch units.

Concrete-Mixing Plant

All concrete for job needs was mixed at the site on mixer boat No. 4, a complete plant mounted on a 40 x 100-foot steel hull. In the tower at the forward end are Butler four-compartment aggregate-storage bins and cement hopper, with full automatic batching equipment. On the level below are two Smith 2-yard tilt-type rear-charge mixers. With a two-minute mixing time, this floating plant has a capacity of 80 cubic yards of concrete per hour.

Sand and gravel aggregate are supplied by the Keystone Division of Dravo, but some crushed stone for coarse aggregate in certain locations was furnished by the Michigan Limestone Co. of Annandale, Pa. A whirler mounted at the stern of the plant unloaded the aggregate from the supply barges, and charged the bins.

Green Bag air-entraining bulk cement came from the Neville Island (Pittsburgh) plant of the Pittsburgh Coke & Chemical Co. in two covered barges holding 3,000 and 1,500 barrels respectively. Fuller-Kinyon blowers forced the cement up from the barge to the bin at the top of the tower through a 4-inch hose line. City water was used in the concrete; a hose line tapped to a hydrant on shore was stretched out to the MB-4.

While the mixer boat operated on

(Concluded on next page)

Four-Lane Road in Pennsylvania Coal Region

Bethlehem Reinforcing Bars used in railroad bridge that spans 48 ft of highway. Notice lane of completed pavement in left background.

Checking the blueprints. *Left to right:* J. D. Montgomery, superintendent for F. D. Kessler, Inc.; Thomas Glaudel, junior inspector, and Adolph Kerewicz, resident engineer, both of Pennsylvania Dept. of Highways.

Two men place Bethlehem Dowel Unit quickly and easily. Unit is designed to help solve the load-transfer problems caused by heavy wheel loads.

Continuing its road-modernization program, the Pennsylvania Department of Highways recently authorized relocation of Route 29 between Hazleton and Tamaqua. The new road is four lanes wide and relatively free of turns. F. D. Kessler, Inc., Northumberland, Pa., was the contractor for the 3¼-mile section pictured here. Bethlehem furnished bar mats, dowel units and reinforcing steel.

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electricity from power sources on shore, it also carried a Caterpillar D13000 diesel-electric 74-kw generator set. This was for emergency use, or when power lines were not available.

Sequence of Operations

During the 1951 construction season the major work included the caisson, settling basin, cofferdams, removal of old land wall, sewer relocation, and lower guide wall. The later sequence of operations involves the removal of old machinery and equipment for salvage, and the partial construction of the main enclosing cofferdam. After the upstream arm of the main cofferdam is completed, the lock gates will be removed.

Then the main enclosing cofferdam will be completed. New cells will be driven as necessary to tie in to those already in place. As the last remnants of the existing structures are removed, the new land wall for the lock will go up, followed by the remainder of the guide walls. Final steps take in the installation of the gates and operating machinery; the operations building is located on the middle wall between the two locks.

Walls are built in 40-foot monoliths. In placing concrete, the usual procedure was to keep the mixer boat in one location, and have a derrick boat or whirler pick up the buckets of concrete from the deck and empty them into the forms. Like the mixers, the buckets have a 2-yard capacity. The buckets were also moved up and down the job on cars operating over dinkey tracks laid on top of the middle wall. At the end of their travel other whirlers picked them up and swung them over the forms.

When operations reach their peak the contractor expects to work both the pile-driving and concrete crews three shifts a day. Floodlights strung along the river bank will supply the necessary illumination for night work. Employment on the project is expected to reach 300.

Quantities and Personnel

With the new 56 x 360-foot riverward lock, the standard tow combination of six barges and tug must be broken to fit the chamber. Double locking is required, with four barges going through first, followed by the two remaining barges and the tug. When the new 110 x 720-foot land lock is completed, it will accommodate two standard-size tows at the same time without breaking up any of the units. This will be a boon to river traffic which now must heave to along the river bank waiting its turn to go through the lock.

Major items in the contract for the second phase of the lock construction include the following:

Excavation	220,000 cu. yds.
Steel bearing piles	54,400 lin. ft.
Concrete	97,836 cu. yds.
Cement	98,000 bbl.
Reinforcing steel	269 tons
Structural steel	432 tons

Directly across the river from the lock, Dravo Corp. is also engaged on an estimated $550,000 construction contract covering repairs to the left-bank abutment of the dam. High water washed away part of the railroad embankment carrying the tracks of the Union Terminal Railroad paralleling the river. This condition was a threat not only to the railroad but also to the dam, and entailed the reconstruction of about 300 feet of concrete retaining wall along the river bank.

A temporary cofferdam adjoining the upstream face of the dam was built first, and this was followed by the construction of a permanent cellular-type foundation from the downstream face, consisting of four 44-foot-diameter cells. The new wall will be built on top of these cells.

R. A. Thompson is Superintendent for the Dravo Corp. on the reconstruction of Locks No. 2 at Braddock.

For the U. S. Army Corps of Engineers, E. P. "Doc" Daugherty is Resident Engineer, and C. V. McGann is Office Engineer. Paul Israel is Inspector on the repair work for the left-bank abutment.

The Pittsburgh District is headed by Col. Conrad P. Hardy, District Engineer. J. S. Minnotte is Chief, Construction Division.

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Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 337.

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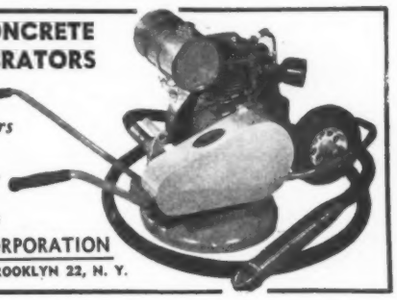

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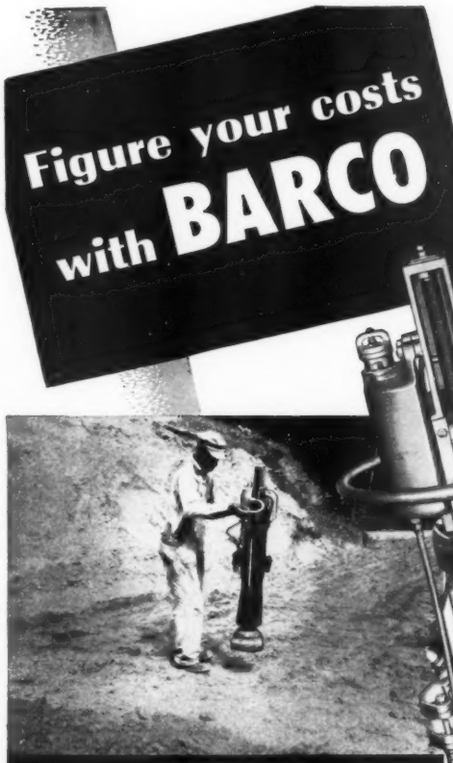

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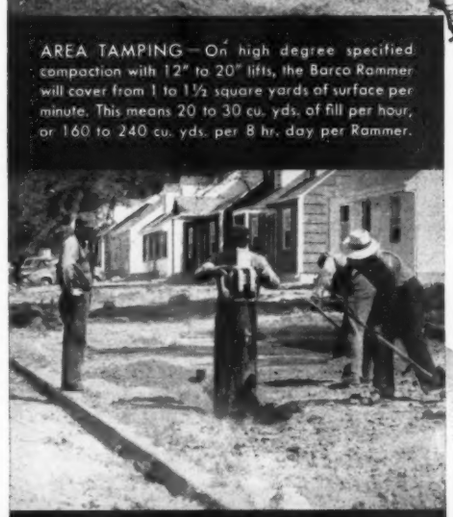

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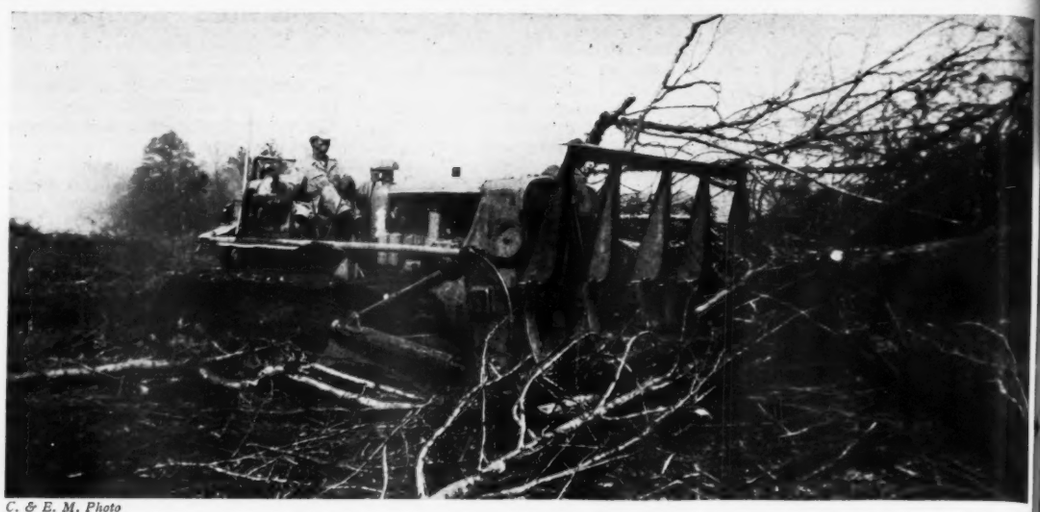
Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 311.

Brown Advances at St. Paul

Leo M. Brown has taken over the post of Assistant Sales Manager for St. Paul Hydraulic Hoist, Minneapolis, Minn., a division of Gar Wood Industries, Wayne, Mich. Prior to his new appointment, Mr. Brown was District Manager covering the territory of Texas, New Mexico, Oklahoma, Mississippi, Arkansas, and Kansas. He has been with Gar Wood since 1949.



C. & E. M. Photo

Land clearing for the Clark Dam project in Georgia. James Huff, of W. M. Huff, Construction Co., Dallas, Ga., is at the controls of the Caterpillar D7 tractor which mounts a Fleco rake.

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The 100 Hour Lantern

No. 40R Traffic-Gard

- Stays lighted 100 hours and more on 18 oz. of kerosene.
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SPEED . . .

SPEED . . .

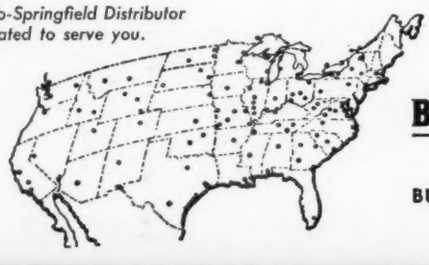
AND MORE SPEED—was the urgent demand of the Authority responsible for constructing the 118-mile New Jersey Turnpike in a record-breaking 2 years.

And speed they got when they specified that all bituminous surfaces be rolled with Buffalo-Springfield 3-Axle Tandems. For tests have proved that the Buffalo-Springfield 3-Axle delivers 50% smoother surfaces, 60% more tonnage compacted than the average obtained with ordinary 8 to 14 ton tandems and 10 to 15 ton 3-wheel rollers.

What is the reason for this phenomenal work capacity and smoother rolling? A unique transfer-of-weight principle developed exclusively by Buffalo-Springfield! The two large diameter guide rolls and the drive roll can be rigidly mounted in a position tangent to the same plane. This means you get a leveling action not possible with ordinary 2-axle tandems and 3-wheel rollers.
Result—*maximum smoothness and tonnage compacted.*

The 3-Axle Tandem will positively give you smoother surfaces—with fewer passes. It will outperform any tandem made—with an absolute minimum of down time. See your Buffalo-Springfield Distributor today, or write for Bulletin S-56-49.

There's a Buffalo-Springfield Distributor conveniently located to serve you.



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BUFFALO-SPRINGFIELD ROLLER COMPANY
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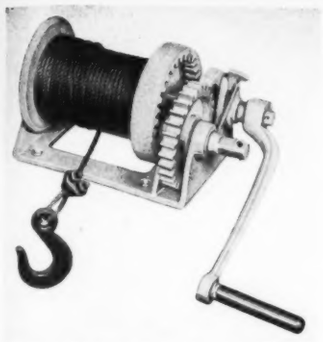

This Gold hand-powered winch has a capacity of ¾ ton—weighs 35 pounds.

Hand-Powered Winch

A hand-powered winch with a ¾-ton capacity is made by Gold Foundry & Machine Works, 1618 S. Osage St., Independence, Mo. All parts are electric steel with bronze bushings. It has a speed ratio of 8.16 to 1 for heavy loads and 3 to 1 for light loads and fast operation. A self-locking pawl holds the load at any desired position.

The unit weighs 35 pounds and will hold 100 feet of ¼-inch wire rope. The company points out that a force of 50 pounds on the 10-inch handle will lift 1,500 pounds on the hook with a single line.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 268.

High-Capacity Screen

A high-capacity V-screen for separating wet or dry materials from No. 4 to the very fine meshes is announced by Nordberg Mfg. Co., Chase and Oklahoma Aves., Milwaukee 7, Wis. It combines a centrifugal and a gyrating action to increase capacities.

The vertically mounted cylindrical screen is 3 feet high and 12 feet in circumference, giving 36 square feet of screening surface. A cupped feed plate with radial vanes is set below the upper edge of the drum. Material to be screened enters through an opening in the top of the frame and is thrust by the feed plate against the inner surface of the drum. The oversize particles are held against the screen for a brief interval, with the fines passing through. Each gyration of the drum—there are 14 to a rotation—produces an inward deflection of the material being screened. This frees the holes in the screening surface for the passage of undersize at the next contact and permits the material to drop a short distance. The process is repeated until the particle either goes through the cloth or is discharged as oversize.

Wear on the cloth is low because there is no sliding action of the particle on the cloth during screening. Whenever the particle and the screen are in contact, both move in the same direction at the same speed. When wire cloth is used, no special forming, hooks, or metal reinforcements are needed and the cloth can be changed to a finer or coarser mesh very quickly.

In wet screening, water sprays are mounted in the lower assembly and strike upward and outward. The screen is built with various types of discharge base, either wet or dry, depending upon installation requirements. The unit is completely enclosed to eliminate dust.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 291.

The high capacity of the Symons V-screen results from combined centrifugal action and gyratory movement.

Underground-Pipe Wrap

A 14-page catalog on a wrapping material for protecting steel pipe against corrosion is available from Glass Fibers Inc., 1810 Madison Ave., Toledo 2, Ohio. It illustrates how Vitron is made from glass fibers, how it is tested, and how it is applied to pipes in the field.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 294.

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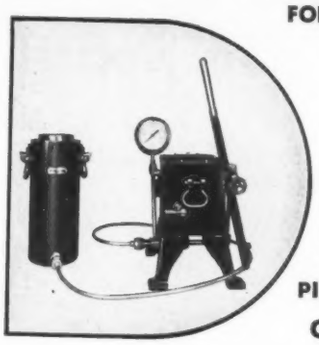
FOR DEPENDABLE PERFORMANCE



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Needle release valve for pin point "lowering"

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Business: Quarry; Asphalt; Contractors
Martin Trailer Model: Folding Gooseneck Tandem Axle Model F5T Serial #5208
Equipment Hauled. Shovels; tandem and 3-wheel rollers; asphalt pavers, #12 Motor Graders; loaders; pit trucks; dozers; crushing, screening and asphalt plant machinery.
Does Truck Driver Load and Unload All Equipment: Yes
Estimated Saving by Owner. Hauling time is cut by at least 50%.
Operating Advantage. We now cover more jobs with less equipment and field repair is cut to a minimum. We now load dead machines and haul them to our central repair shop where tools and mechanics are available, greatly reducing costs and time.
Statement By Owner: The Martin "Folding Gooseneck" Trailer has far exceeded our expectations. With the exceptional speed and safety with which it moves our equipment, it has helped increase our annual output, reflecting a considerable dollar and cent saving to our business!

Signed: Newton J. Kellam
Newton J. Kellam
Vice President

Low-traction, three-wheel roller is driven up the ramp formed by the "Folding Gooseneck." Fast-loading, fast-hauling, fast-unloading, the Martin "Folding Gooseneck" is unequaled for money-saving ability

J Lynn Kellam, General Superintendent; and Newton J Kellam, Vice President of Kellam & Shaffer Co., Schenectady, N Y.

For information on the Martin "Folding Gooseneck" Trailer model that can cut your hauling costs and time — see your Martin "Caterpillar" Dealer!

MARTIN Trailer

MARTIN MACHINE CO.
KEWANEE, ILLINOIS, U.S.A.

WASHO Group Convenes in Seattle

Finances, Future Problems, Present Highway Jam, Feature Annual Conference of Western Road Builders

• "IT isn't our job, as highway officials, to protect the traditions of the past. It is our job to serve the motoring public."

So said W. A. Bugge, Director of Highways for the state of Washington and President of the Western Association of State Highway Officials, as he addressed the 31st Annual Conference of the western road-building organization in Seattle, June 5. Bugge was but one of many speakers who tried to define the part which the highway engineer must take in solving the greatest traffic jam in history on America's highways. Approximately 450 delegates from the 12 western states participated in the 3-day meeting in Seattle's Olympic Hotel.

From the opening welcome by Governor Arthur B. Langlie, to closing resolutions, the theme was the steadily mounting emergency on America's highways. Financing, toll roads, cooperation between engineers and contractors and road users, and recent advances in highway construction and maintenance were topics on the agenda.

Bugge Reports

In his report, the outgoing WASHO President briefly reviewed facts every highway engineer knows all too well: a western population increase of 41 per cent between 1940 and 1950 while the nation's average was 11 per cent; the doubling of highway costs since 1940, with the possibility of even higher costs to come; the need for 30,000 engineers per year for 10 years, when the actual present supply of engineers is 12,000; increasing difficulty with financing . . .

But then Bugge, in a statement junking traditional lines of highway thinking, called for a new approach by the engineer. It would help, he said, to stop minimizing the picture and to start admitting its seriousness. It would help if engineers assumed the responsibility for mistakes they have made, "along with everybody else who couldn't possibly envision the startling growth of the motor age". The pay-as-you-go highway financing plan must be supplanted with something more realistic; perhaps a bond scheme which will let users pay as they ride. Bugge even had a good word for toll roads, in the special cases where they are indicated.

Engineer Shortage Reviewed

The engineer shortage, one of the mounting problems of most highway departments, came up for discussion in the program as Raymond Archibald, Chief of the Western Headquarters of the Bureau of Public Roads, spoke on "More Engineering With Fewer Engineers".

"You hear a great deal these days about the inefficiency of labor", Archibald said. "But possibly engineers are inefficient, too. Engineers use a great deal of time for things other than engineering."

Archibald urged that traditional concepts of engineering costs be done away with, so that more engineering can be done with fewer engineers. Aerial surveys, radio communication, highway-department-owned airplanes which would save many a travel hour for pro-

(Continued on next page)

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Special Features:

Protection for the operator in all kinds of weather — Maximum visibility — Quick installation. Complete operator comfort and roominess — Unobstructed entry to the operator's compartment.

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CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York 16, N.Y.

ductive engineering, and specifications which outline only the results desired instead of the steps a contractor must follow, would all help engineering talent to go further, said Archibald. Lump-sum bids on many an item would reduce calculations and possibly reduce costs too, he said.

Archibald even suggested that many miles of travel and many an engineering man-hour could be saved if regional meetings of the general AASHO organization were held on a separate day or two of the annual meeting of the parent organization.

Other speakers, too, reported that the engineer shortage was becoming more serious. A. S. Horner, President of the Associated General Contractors of America, reported that the AGC is beginning in many sections of the country to underwrite a limited number of scholarships. At a joint meeting between the WASHO and AGC Highway Branch, the shortage of engineers was one of the subjects discussed.

Abolish Federal Aid

Charles M. Ziegler, State Highway Commissioner of the Michigan State Highway Department and Vice President of the AASHO, declared that the Federal government is one of the worst offenders in the diversion of highway funds, and told delegates it would be his preference to abolish Federal Aid and the loss of revenue to the states which seems to go with Federal Aid. The general deficiency of the interstate highway system, he said, can be charged to the Government's practice of diverting revenues; $1,700,000,000, he pointed out, is being collected by the Federal government in gasoline and excise taxes and is not being returned to the roads. Either the Government should abolish Federal Aid entirely or it should place this money on the highways, he said.

Toll Roads Analyzed

An objective analysis of toll roads was made by Mark Watrous, Chief Engineer of the Colorado State Highway Department, who called them "the newest craze" and said that they were gaining tremendous public acceptance. In spite of the fact that the 17.3-mile Denver-Boulder Turnpike was opened in January, at the lowest traffic ebb of the year, January revenue was above the estimated mean monthly figure.

Watrous declared that the Denver-Boulder Turnpike filled a need which could not have been met in any other way for years to come. When such a need exists, he said, a toll road is justified. While it seems to be no solution to city traffic, he explained, it is a peculiarly successful answer where traffic is heavy and permanent enough to generate the revenue to sustain maintenance and operating costs and interest on bonds, and to amortize the principal in from 25 to 35 years.

People seem to know instinctively what is a fair and equitable toll fee, he said, and they do not object to the 25-cent fee for the 17.3-mile turnpike trip. Watrous told how toll-road financing can be expedited with most bankers by having the engineering done or at least verified by a recognized private consulting firm. He called attention to Government inconsistency in the matter of toll roads by saying that the Bureau of Public Roads has opposed them consistently, but that RFC and the PWA both aided in financing construction of the Pennsylvania Turnpike.

In general, Watrous found nothing wrong with toll roads if they met his conditions for solvency, and he suggested that any highway work—toll or otherwise—which would help to solve the current traffic muddle should be encouraged. Instead of the usual operation of a toll road by some autonomous group, he proposed that a toll road be operated by the state highway department in the state it serves.

Construction Maintenance

Problems of policy and administration are no more difficult than routine matters of construction and maintenance, as engineers continue their day-to-day battle to make the present highway system last. This was the consensus of several papers on construction and maintenance.

The maintenance group, discussing flexible pavements in frost breakups, snow removal, and road-condition bulletins, agreed that the public is now demanding much more of the maintenance engineer than it did formerly. Earl V. Miller, Idaho Chief Engineer, told how people who were formerly prudent in winter now disregard storm warnings and start out in their automobiles at any time without tire chains or even warm clothing, expecting that the highway department will maintain the road in a passable condition at all times.

E. A. Collier, Maintenance Engineer of the Oregon State Highway Department, described causes and preventive measures in frost breakups on flexible pavement. According to Collier, a flexible pavement suffers frost breakup when four conditions occur: (1) when there is moisture in the subgrade; (2) when there is frost to appreciable depth, followed by thaw; (3) when there is a

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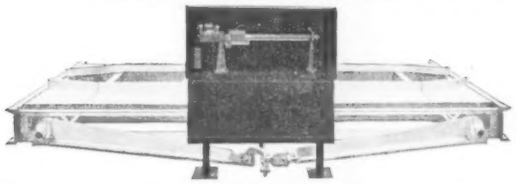

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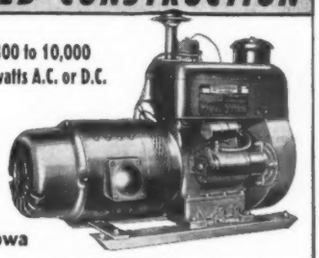

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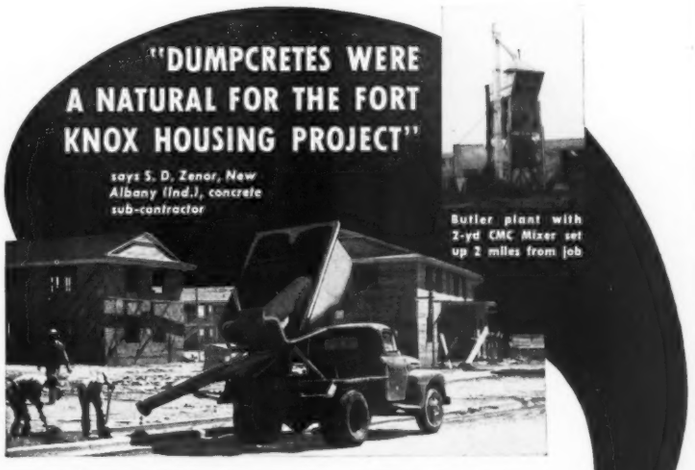
"DUMPCRETES WERE A NATURAL FOR THE FORT KNOX HOUSING PROJECT"

says S. D. Zenor, New Albany (Ind.), concrete sub-contractor



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"32,000 yards is a lot of concrete," says Mr. Zenor, "especially when you make your pours in close quarters."

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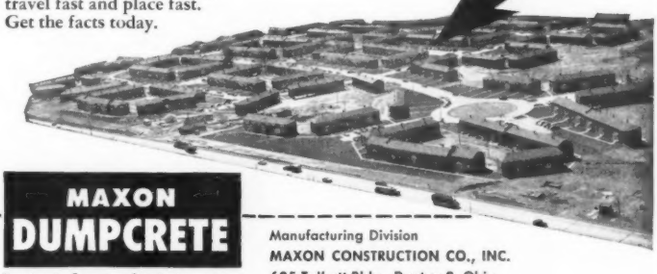

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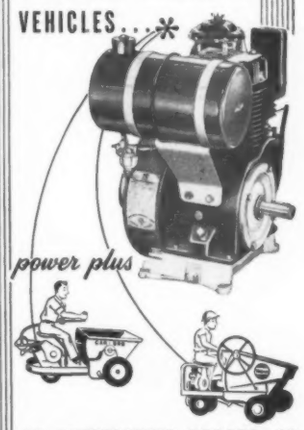

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WASHO Group Convenes in Seattle

(Continued from preceding page)

lack of adequate base; and (4) when there are heavy truck loads.

"Eliminate any one of the four," Collier said, "and you will greatly reduce damage."

Collier then told how each one of the four dangers can be minimized. Moisture can be controlled by keeping the ditches clean, the culverts open, the oiled surface sealed, and possibly the shouders oiled. During construction the subgrade should be crowned, a trench section avoided, all water pockets drained, adequate side ditches and tile placed, and granular topping provided.

According to Collier, inadequate base material is one of the worst contributors to frost damage, and the Oregon engineer advised that the subbase material should be at least one-half the depth of maximum frost penetration, in order to blanket the subgrade and distribute the wheel load. It is impossible to maintain a road with too thin a base, especially in the spring breakup, he said.

Collier's suggestion on how to beat the money bugaboo was to the point. "When a project calls for too much money, cut the length of the job—not the thickness of the base. Design base thicknesses in increments of feet, not inches."

As for heavy truck loads, Collier strongly recommended that they be controlled, and he commended Charles Motl, Minnesota's Maintenance Engineer, for being one of the leaders in this movement.

PAR Message Brought

Project Adequate Roads, PAR, was explained to WASHO delegates by Arthur Butler, Director of the National Highway Users Conference, Washington, D. C. According to Butler, PAR's objective is to awaken the general public to an appreciation of the average highway engineer's problems.

L. I. Hewes Awards Made

Recipients of the first L. I. Hewes Award, made in commemoration of Dr. L. I. Hewes, late Chief of the Western Headquarters of the Bureau of Public Roads, included two young engineers. They were James T. McWilliam, Assistant Engineer of the headquarters office of the California Division of Highways, and Herbert W. Humphres, Soils Engineer of the state of Washington.

Several resolutions were passed, including one to put all new funds into construction immediately, without a minute's delay. Two of the resolutions supported legislation now being proc-

(Concluded on next page)

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Thus cuts maintenance costs, reduces downtime, prolongs tool life

Oil flow from Arnold Lubricator starts when air tool starts, stops when tool stops, automatically lubricates all working parts. Oil flow easily adjusted to tool needs. Can be filled under line pressure; window tells you when.

Light weight. Easily installed in hose line or on bench. Streamlined to prevent catching. No moving parts to get out of order. 4 sizes. Order from your equipment dealer TODAY, or write us for leaflet and prices.

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ASPHALT: For compacting asphalt in such operations as highway widening and patching, paving walks, drives, railway platforms and crossings, there's nothing that equals the convenience and time-saving features of the Jackson Vibratory Compactor. And the quality of work it does is unsurpassed by far more costly and cumbersome equipment. Small as it is, the Jackson delivers up to 4500 1¾ ton blows per minute. It propels itself and will compact 900 to 1200 sq. ft. per hour close to maximum density of the asphaltic mix used. And it is easy to move from place to place by means of a quick pick-up trailer unit on which the power plant, from which it is operated, is mounted.

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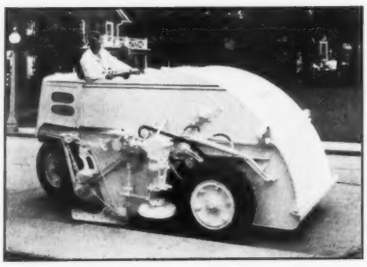

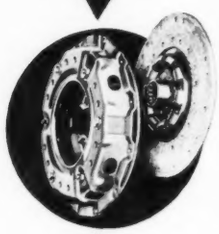

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314 Catherine Street, Rockford, Illinois, U.S.A.

B-W ENGINEERING MAKES IT WORK

B-W PRODUCTION MAKES IT AVAILABLE

ENGINEERING BULLETIN SENT ON REQUEST

ROCKFORD CLUTCHES

The state of Washington received a traffic award at the WASHO meeting. In this picture, in the usual order, Rex Still of Washington, Traffic Engineer; Washington Director of Highways W. A. Bugge; and B. F. Crandall, who made the presentation.

essed: Senate Bill 3149, which authorizes payment for the relocation of highways damaged by inundation of reservoirs and other such improvements built by other agencies; and HR-3764, which gives more consideration to highway structures over navigable streams. In the case of the Senate bill, the WASHO resolution urged that a more equitable settlement than "replacement in kind" was needed.

One resolution called for support of well vegetated and healthy watersheds, and condemned overgrazing, overcutting, and those other practices which denude a watershed and make floods likely. One resolution condemned the railroads' attitude on protective liability for contractors, and urged that further study be made by the Executive Committee of the AASHO.

New Officers

New officers for 1952-53 include Mark U. Watrous of Colorado, President; E. V. Miller of Idaho, Vice President; and William E. Willey of Arizona, Secretary-Treasurer. On the Executive Committee for the coming year are D. C. Greer of Texas, W. C. Williams of Oregon, and W. A. Bugge of Washington.

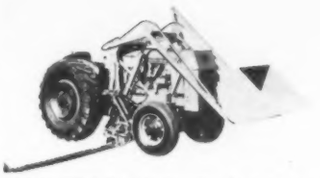
More scrap metal is needed again to maintain and increase high steel output. Everyone must help, so put your scrap to work for more steel.

Loader and Mower Work Independently

A new addition to its line of loaders is announced by Lull Mfg. Co., 314 W. 90th St., Minneapolis 20, Minn. The Model 3-B Shoveloader is built for use on the Minneapolis-Moline RTI tractor in conjunction with the M-M SMRI mower attachment. The mower can be attached without interfering with the operation of the loader. Both loader and mower operate independently of each other.

The 3-B is available with a ⅜-yard material bucket, a ½-yard loose-material bucket, a ¾ to 1-yard coal or snow bucket, bulldozer, lifting crane, fork lift, fluid-driven sweeper, and motor-driven sweeper. The bucket is controlled by a parallelogram mechanism which automatically keeps the bucket level while it is being raised.

Further information may be secured from the company. Or use the Request Card bound in at page 16. Circle No. 350.



The Lull 3-B Shovelmaster is built for use on the Minneapolis-Moline RTI tractor in conjunction with the M-M SMRI mower attachment.

Cummins Sales Personnel

There have been two changes in the Sales Division personnel of Cummins Engine Co., Inc., Columbus, Ind. Harold H. Hall, formerly General Service Manager, is now General Manager, Cummins Diesel Export Corp., with headquarters at Columbus, Ind.; and Charles C. Sons, formerly Eastern Service Manager, is Acting General Service Manager for Cummins Engine Co., in succession to Mr. Hall.

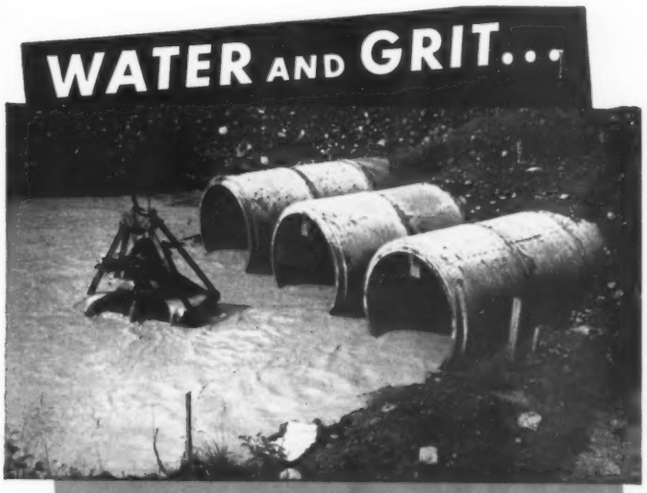
OVERMAN'S STONE AND BITUMINOUS SPREADER

Cuts Your Cost . . . .

IT'S THE ANSWER TO YOUR NEED for an efficient low-cost SPREADER-PAVER that lays Hot Mix, Semi-Hot Mix and Free-Flowing Cold Mix, with speed and ease. Its perfect adaptability for State, City and County work, also parking lots, driveways, etc., makes it unique and revolutionary in the field of spreaders.

WRITE FOR BULLETIN

I. J. OVERMAN MFG. CO.
BOX 203 MARION, IND.



DON'T DAMAGE an OWEN BUCKET

With a less expertly designed bucket water would likely carry abrasive sand and grit into the bearings causing excessively rapid wear and deterioration.

Not so with an Owen.

Years ago Owen engineers learned the hazards of difficult underwater service.

And through experimentation and experience they designed bearings that retard these destructive forces.

For the protection of your buckets and in your own financial interest "buy an Owen" equipped with *abrasion resisting, pressure-lubricated bearings.*

Get the interesting Owen catalog.

"A mouthful at every bite"

BUCKETS AND GRAPPLES

THE OWEN BUCKET CO.
6030 Breakwater Avenue • Cleveland, Ohio
Branches: New York, Philadelphia, Chicago, Berkeley, Calif.

Here is the LOW COST way to . . .

REBUILD Gyratory Crushers!

MANGANAL
U. S. Patents 1,876,738—1,947,167—2,021,945
11%-13½% Manganese-Nickel Steel
ROUND APPLICATOR BARS

. . . Put Your Equipment Back to Work Faster!

MANGANAL — the toughest metal known — work hardens under impact and abrasion to 550 Brinell . . . tensile strength up to 150,000 p.s.i.

GYRATORY CRUSHERS rebuilt with MANGANAL usually outlast new ones.

MANGANAL ROUND APPLICATOR BARS are available in 11 sizes for all conditions of wear.

Use MANGANAL Bare or Special *TITE-KOTE ELECTRODES* to fill in low spots on Gyratory Mantles and to attach Applicator Bars.

FREE
Literature on the latest methods for speedy and economical repair of worn equipment.
Name of nearest distributor on request.

STULZ-SICKLES CO.
SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

This new Pick-Up model of the Hopto digger has its own power source—a Wisconsin VF4 air-cooled engine. The Badger Machine Co., Winona, Minn., makes it.

A Hydraulic Digger With Separate Power

Trailer mounting and an independent power source for the Hopto digger are announced by Badger Machine Co., 1122 W. Fifth St., Winona, Minn. Formerly a power-takeoff model, the Hopto Pick-Up is powered by a Wisconsin VF4 air-cooled engine with 2.1 reduction. It is completely hydraulic and is moved by a pickup truck, Jeep, or tractor.

The unit can dig a 6-foot-deep trench 60 feet long in one hour, the company claims. The 24-inch bucket is said to be capable of excavating 45 yards per hour. The unit can reach 15 feet 4 inches and swings a full 180 degrees.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 343.

Wall Chart on Lubrication

A wall chart that gives information on the proper lubrication of standard trucks is available from Socony-Vacuum Oil Co., 26 Broadway, New York 4, N. Y. One side pictures a generalized chassis, with component parts keyed to groups of cutaway illustrations and accompanying text.

Over fifty engine and body parts are listed, with information on the kind of lubricant to be used, method of application, path of the lubricant, and the lubricated surfaces of the particular part. Different colors—green, red, and grey—indicate the period at which each unit should be inspected.

The reverse side of the chart lists all standard truck models with recommended engine, transmission, and drive-axle lubrication.

This chart may be obtained from the company, or by using the Request Card that is bound in at page 16. Circle No. 262.

Tool Miters Metal

A hand tool for mitering metals is offered by Lander & Abbott, La Crescenta, Calif. The Metalmitre uses a number of dies for burr-free mitering, notching, and slotting of nonhardened steel up to 1/32 inch and metals like copper and aluminum up to 1/16 inch. It is applicable for work with molding, sheet metal, fiberboard, plastics, etc. The tool weighs 2 pounds assembled and fits in your back pocket.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 295.

This hand tool, the Metalmitre, for mitering metals weighs 2 pounds and fits in a back pocket.

Bulletin on Generators

A bulletin on a line of generators and power plants is available from Kato Engineering Co., 1415 First Ave., Mankato, Minn. It illustrates and describes revolving armature and revolving field types of generators, motor-generators, rotary converters, and stationary and portable gasoline-engine-driven plants. The portable units are furnished with handles, dollies, or trailers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 322.

on the world's
BIGGEST
wire rope jobs...

experienced riggers demand
GENUINE
CROSBY
CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners
• SIZES FOR ALL WIRE ROPE
• DISTRIBUTORS EVERYWHERE
AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

Dependable Equipment for the Construction Industry

1852 1952

for 100 Years

Manufacturers of Pile Driving Hammers and Pile Extractors
VULCAN IRON WORKS • 329 NORTH BELL AVENUE • CHICAGO 12, ILL.

HEWITT-ROBINS

Right Hose Combination for Cost Conscious Contractors

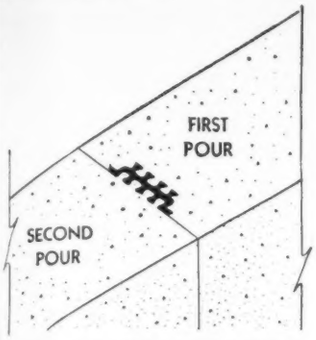
Hewitt-Robins Air Hose: Saves you money by providing longer service life, higher operating efficiency and lower replacement costs. Because, it is designed to give maximum flexibility and ease of handling under the highest working pressures and withstand roughest treatment on any job.

Hewitt-Robins Cement Placement Hose: Meets the heaviest service requirements for building cement reinforcements in mines, tunnels, viaducts and bridges . . . A heavy-duty hose that is light and flexible enough for one man to handle. Its specially compounded rubber tube resists abrasive action of sand and cement . . . multiple-ply construction of high-tensile duck provides extra strong hose wall that eliminates need for outer cover.

No matter what you're building, you can be sure Hewitt-Robins has the *right* hose—from air hose to Twin Weld®—to meet your specific requirements. Hewitt-Robins also manufactures conveyor and transmission belting, pipe slings and Rubberlokt® wire wheel brushes.

For complete hose facts, call your Hewitt-Rubber Distributor (see "Rubber Products," Classified phone book.)

HEWITT-ROBINS HR INCORPORATED
STAMFORD CONNECTICUT
Hewitt Rubber Division
Hewitt Restfoam® Division
Robins Conveyors Division
Robins Engineers Division



Here's how the plastic Harza Labyrinth (Water Seals, Inc.) water stop joins a first and second pour and seals the joint against leaks.

Plastic Water Stop

A new type of water stop made of polyvinyl plastic has been placed on the market by Water Seals, Inc., 400 W. Madison St., Chicago 6, Ill. The Harza Labyrinth is ribbed, grooved, and corrugated to form a bond with the concrete and maintain the seal under conditions of severe contraction. It is nailed to the inside of the form and can be cut by a knife; sections can be joined by a hot knife or torch. It is said to be effective on hydraulic structures where shrinkage openings of ½ inch or less are expected.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 334.

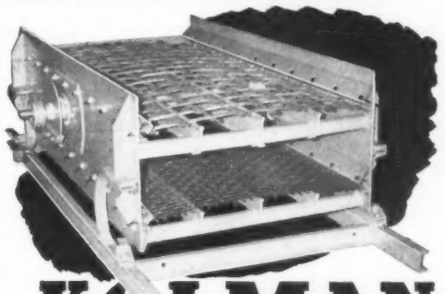
Line of Paving Products

A new type of easy-reference catalog on its line of paving products is available from Keystone Asphalt Products Co., 101 E. Ontario St., Chicago 11, Ill. Staggered pages make it easy to locate the information you want.

The Kapco line includes expansion joints, joint sealers, tongue-and-groove joints, and dummy joints. Expansion joints are made of fiber, asphalt, or Fiberglas. The catalog describes all these products and illustrates their applications with on-the-job photos.

This literature may be obtained from the company, or by using the Request Card bound in at page 16. Circle No. 349.

Get a BETTER SHAKE!



KOLMAN

VIBRATING SCREENS

- Floating action-full, vigorous vibration gives clear, accurate separations.
- Compact design — more screening capacity per square foot.
- No damaging vibrations transmitted to frame or other equipment.
- Rugged construction
- Priced right.

Want a screen that handles greater volume with less operating expense? Construction men everywhere say the new KOLMAN Series "C" is the screen for the business. Choose single or multi-deck models in a wide range of sizes. Choose the KOLMAN that's right for your job!

Write TODAY for illustrated folder—

KOLMAN MANUFACTURING CO.
4922 W. 12th Street • Sioux Falls, S. D.

DAREX AEA
Used in more concrete construction than any other
AIR ENTRAINING AGENT

LaGuaira Harbor Passenger Terminal, Caracas, Venezuela
Engineers and Contractors: Frederick Snare Corporation.
When this photo was taken, the first bay had been painted, others had not. Note the smooth-as-plaster texture of the painted DAREX AEA concrete!

On job after job these facts have been proved; air entrained concrete with air content closely controlled through the use of Darex AEA places easier and faster, finishes better, has better surface texture, is more homogeneous and more durable when exposed to freezing and thawing. Readymix concrete plants everywhere can furnish concrete made with Darex AEA. Ask your supplier, or write to us for helpful 20-page illustrated booklet.

D A
CONSTRUCTION SPECIALTIES DIVISION
DEWEY and ALMY Chemical Company
Cambridge 40, Mass. • Chicago 38
San Leandro, Calif • Montreal 32

Portable Asphalt Plants For City, State, Repairs and Small Contract Work

These 8-10 tons per hour Asphalt Plants economically repair almost any pavement. Asphalt, brick, concrete, macadam, can be resurfaced or patched. Alleys, driveways, sidewalks, industrial plants can be paved. Produce for immediate hot laying, or for deferred cold patching. Match any bituminous surface.
Mixes at plant, including labor, fuel, and overhead, cost about $4 per ton, with $2 aggregate. Average 160 to 200 sq. yds. 1" thick per hour.
A moneymaker for small contract work.
Also larger plants, 15 and 30 tons per hour.

Write for catalog and name of nearest dealer.

Elkhart White Mfg. Co. Indiana

... the new separable
FLEXCO HINGED
BELT FASTENERS

U. S. Patent No. 2,477,855

For joining grader, trencher, ditcher and other earth moving conveyor belts.
For belts ⅜" to ½" thick.
A FLEXCO fastener that is HINGED. Has removable hinge pin.
Troughs naturally, operates through take-up pulleys.
Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4608 Lexington St., Chicago 44, Ill.

Yours for the Asking

An extra set of tear sheets of any CONTRACTORS AND ENGINEERS MONTHLY article you may wish to file for future reference.

Our Reader Service Dept. will send such articles pasted on standard file size sheets if you request it.

Distributor Doings

Hydrohoe Shown by Crook Co.

After traveling 2,500 miles in 6 days between South Milwaukee and Los Angeles, a GMC-truck-mounted Hydrohoe demonstrated its versatility by digging a pipeline trench, a garage excavation, and two swimming pools in less than a week after its arrival. The exhibition of mobility was sponsored for contractors and interested city officials in southern California by Crook Co. of Los Angeles and the Bucyrus-Erie Co., manufacturer of the Hydrohoe.

Driven by Service Engineer Andrew P. Hofierka of Bucyrus-Erie, the Hydrohoe averaged 400 miles per day over U. S. 66. Within one working day after its arrival in Los Angeles the machine had been washed and serviced, and moved to Bakersfield, 120 miles north, for the first part of the demonstration.

A 60-foot leach line trench 5 feet wide and 7 feet deep was excavated in 3 working hours at Bakersfield, through a formation of cemented sandy hardpan which had stopped a clamshell bucket which Contractor E. F. Core had been using. The hardpan was handled by the standard ⅜-yard bucket on the Hydrohoe, without side cutters.

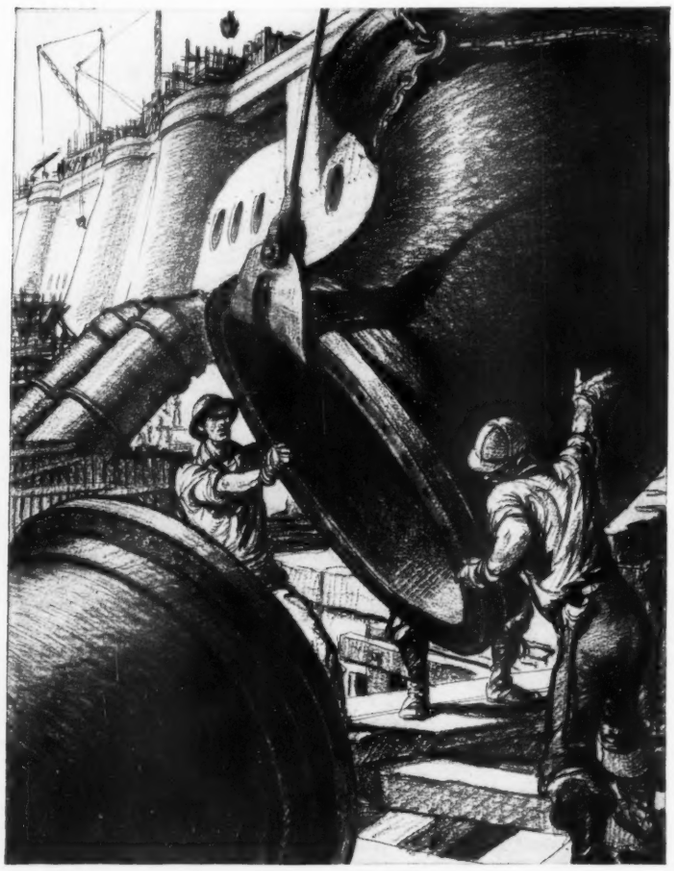
The next day, at Whittier, 100 cubic yards were excavated in 5 hours for a building garage. The formation was a soft loam, and was easy to dig. Here, however, the Hydrohoe loaded excavated material to dump trucks which hauled it away. The machine gave a similar account of its digging ability by excavating two swimming pools in an 8-hour shift a day later, in another part of Los Angeles.

The demonstrations produced much favorable comment and at least one tentative order from contractors and officials who saw the Hydrohoe's performance. Program arrangements were made by Crook Co.'s management which includes W. D. Crook, owner; D. Chase, Sales Manager; Hal Cad

(Continued on next page)

Ray Day Photo

The interested spectators at Crook Co.'s Bakersfield demonstration of the Hydrohoe included a few potential customers for 1975, in the foreground. Note the depth of this trench and the yardage.



On the job...and on the bond

EXPERIENCE COUNTS

No one who has watched a mighty river slowly submit to the will of man can fail to marvel at the technical genius of our American construction experts.

Experience, of course, is the answer — for with experience comes proficiency.

This is true not only in the construction industry but in the related field of contract bonding. For it is also experience — gained through more than 40 years' association with contractors handling jobs of every type and size — which enables the agents, underwriters, and fieldmen of the Ætna Casualty and Surety Company to give you prompt, intelligent contract bond service whenever and wherever you need it.

"No Job too Big— No Job too Small"

ÆTNA

ÆTNA CASUALTY AND SURETY COMPANY

The Ætna Life Affiliated Companies write practically every form of insurance and bonding protection

LIFE AND CASUALTY
Ætna Life Insurance Company
Ætna Casualty and Surety Company

FIRE AND MARINE
Automobile Insurance Company
Standard Fire Insurance Company

Hartford 15, Connecticut

Year-around All-Weather Patching Now Possible with

McCONNAUGHAY HOT (UP TO 300°F) OR COLD "MULTI-PUG" ASPHALT MIXER

The Patchi Mixer for Summe or Winter

The best way keep repa costs down i repair th breaks wh they first a pear.

MODEL HTD

DEALERS: WRITE US FOR EXCLUSIVE TERRITORY AND PERSONAL DEMONSTRATION

CABLE: McCONN

K. E. McCONNAUGHAY • LAFAYETTE, IND.—U.S.

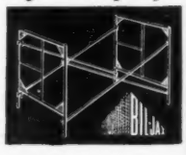
BIL-JAX Tubular Steel SCAFFOLDING

...is PROFITABLE on every building job!

Gets you UP *in the world . . .* FASTER SAFER EASIER

OWN or RENT . . . either way it pays!

Get the most in profit and speed in all your jobs. Bil-Jax Scaffolding is light in weight . . . is easy and fast to set up and take down . . . and is SAFE, even with heavy loads. Other Bil-Jax money-makers: swing scaffolds, metal stages, rolling trestles, sectional and lean-to ladders, ladder jacks, leveling jacks, accessories. Distributors in principal cities.



Write for literature . . . ask for bulletin C-7

BIL-JAX, INC. ARCHBOLD, OHIO

Distributor Doings

(Continued from preceding page)

Manager of the Bakersfield office; and by Bert Lowe, Los Angeles representative of Bucyrus-Erie Co.

Omaha Dealer Marks Anniversary

Actuarial figures show that folks in Nebraska have the highest life expectancy in the nation. Maybe this longevity carries over into the construction-equipment business. Interstate Machinery & Supply Co. of Omaha is celebrating its 50th year of successful service to the industry.

Founded back in 1902, when contractors were still relying on horse-drawn wagons and hand tools, the company has now grown to an impressive organization selling a full line of modern machines. Headed up by D. M Edgerly, Jr., President, it has a full-time staff of 60 employees and occupies a three-story building at 10th and Douglas Streets. A nearby warehouse is also used to stock some of the heavier pieces of equipment.

Interstate covers all of Nebraska and the three tiers of Iowa counties along the Missouri River, supplying a full line of equipment to meet just about every contractor's need. There are always a lot of reasons for a company's success. As far as Interstate is concerned, one of these might be its efficient record of salesmen's calls. Set up somewhat like a perpetual inventory, it shows the exact call record for each customer for a 10-year period. A sliding tab indicates the month of the last call. Marks on the card indicate whether more than one call has been made in any month, and varied colored tabs tell whether the customer is on the mailing list for the company's bimonthly bulletin and direct mail. The call record is also used to credit "over the transom" orders. If the salesman has made a call within the preceding 3 months he gets a commission for the sale.

A new Bruning duplicator for making invoice copies has recently been installed. This will reduce the time for monthly invoicing to one-quarter that previously required.

Rocky Mountain for N. Y. Belting

Rocky Mountain Machinery Co., Salt Lake City, Utah, has taken over the distributorship in Utah and southeastern Idaho for New York Belting & Packing Co., Passaic, N. J. New York Belting manufactures belting, hose, packing, and other industrial rubber goods.

Ray Lott has taken to the field for Cleveland Bros. Equipment Co., Harrisburg, Pa., as Parts and Service Field Representative.

Tours Dealer Territory by Truck

Ray Lott has taken on a new job at Cleveland Bros. Equipment Co., Harrisburg, Pa. As Parts and Service Field Representative, he will make periodic calls on customers to help them get the maximum use of their equipment. In a

(Continued on next page)

DESIGNED FOR THE CONTRACTOR

*MODEL 3S—Basic Model, 147 lbs.

• A LOW-COST
• RUGGED CONSTRUCTION

Portable Concrete Mixer

$69.95 retail
F.O.B. factory

HEAVY-DUTY ALUMINUM ALLOY CONSTRUCTION outwears cast iron.
A concrete mixer with ONE FULL WHEELBARROW CAPACITY.
ONE MAN OPERATION makes easy three cubic foot batch.
11 models available - mounted gas or electric engine opt.
—interchangeable parts for all models with 24 hour replacement service. Completely guaranteed.

MODEL 3RBG - 1½ H.P. gas engine with rubber tire trailer and mortar box. 363 lbs.

WANTED: DISTRIBUTOR and JOBBER OUTLETS. RETAIL DEALERSHIPS also invited. Write immediately for catalogue information and trade discounts on 11 models of Wright Portable Mixer.

WRIGHT ENGINEERING & SUPPLY CO.
Est. 1918 • Denver, Colo.

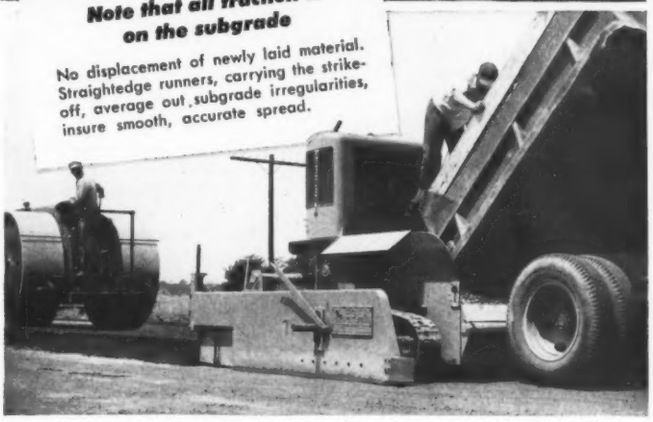
MAIL TODAY

WRIGHT ENGINEERING & SUPPLY CO.
1302 S. Bannock St., Denver 10, Colo.
Please Send Catalogue Information and Trade Discounts on 11 Models of Wright Portable Mixer for a:
☐ Distributor ☐ Retail Dealer
NAME
ADDRESS
CITY STATE

Jobs like these are "naturals" for your Jaeger Aggregate Spreader

Laying granular sub-base, Pennsylvania Turnpike

(12" compacted blanket of crushed shale laid in 2 courses, each 8" thickness before compaction, 12' wide.)
Jaeger Spreader is ideal for laying all base and surface aggregates — up to 12" thickness in widths to 11', lesser thicknesses to 12½'.



Note that all traction is on the subgrade

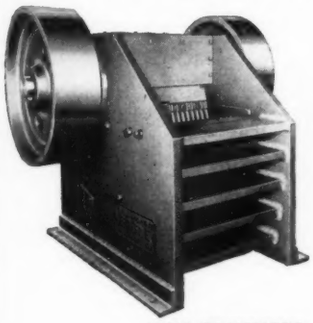
No displacement of newly laid material. Straightedge runners, carrying the strike-off, average out subgrade irregularities, insure smooth, accurate spread.

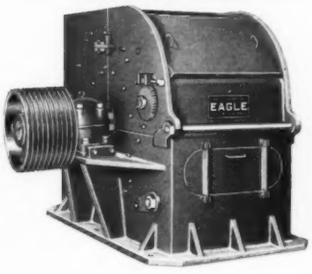
A Jaeger Aggregate Spreader, with either crawler or 4-wheel traction (interchangeable to suit subgrade conditions) costs only half the price of a bituminous paver. With it, you can lay all types of aggregates, plant-mixed stabilized soil or free-flowing bituminous mixtures, either hot or cold, in a much greater range of widths and thicknesses, as fast as your trucks can deliver and with the accuracy required for highway, street and airport base, and both base and top for secondary roads, parking areas and drives. Machine blends joints, places flush to curbs. Two models, to suit any size of trucks.

For details, see your Jaeger distributor or send for Catalog SPS-1

THE JAEGER MACHINE COMPANY
701 Dublin Avenue, Columbus 16, Ohio
COMPRESSORS • PUMPS • MIXERS • HOIST TOWERS • PAVING MACHINES

A Sturdy pair of EAGLES





JAW CRUSHERS
Electrically welded, one - piece, Gibralter-tough frames. Reversible wear parts add much to economy of operation. In five sizes — both stationary and portable. Send for folder 1043-131-A for complete specs.

HAMMERMILLS
For uniform, high-rated output, for easy access to wear parts, you can't beat an EAGLE! This model often doubles for primary crusher, too. Several sizes. Send for bulletin 251-131-B, for complete details.

By the makers of Eagle Truck-mounted Loaders

EAGLE
JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS
CRUSHER CO., Inc. GALION OHIO·U·S·A

Distributor Doings

(Continued from preceding page)

new truck specially equipped for this purpose, Mr. Lott covers the entire Cleveland Bros. territory, including the firm's two branches in Wilkes-Barre and Frackville. The firm handles Caterpillar, Link-Belt Speeder, Athey, Trackson, Hyster, Marlow, and Martin equipment.

Servicemen's Training School

The Unit Crane & Shovel Corp., Milwaukee, Wis., has reopened its servicemen's factory training school. At the first session, April 21-25, nineteen distributor firms were represented, and those attending the school had an opportunity to study service techniques and get first-hand answers to their questions. Discussion of new machine installation, field repair, operating and maintenance instructions formed the chief items on the agenda.

At the conclusion of the five-day school, each man received a certificate of attendance and a folder with a photograph of the whole class.

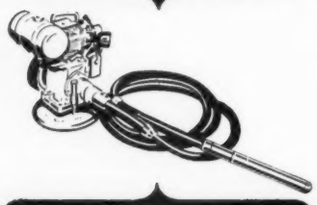
Nineteen distributor firms were represented at Unit Crane & Shovel Corp.'s servicemen's factory training school. At extreme right (front row) is L. Schaefer, Unit's Parts Manager, and behind him is James Strode, Service Manager.

Buys Firm, Makes It Distributor

Continental Motors Corp., Muskegon, Mich., has purchased the business, stock, and equipment of Standard Engine & Supply Co., located on Highway 80 at Standard St., Greggton, Texas, and will operate it as a distributorship under its southwestern branch at Dallas. The new east-Texas distributorship will be on a status identical with that of independent distributors and subject to the same policies as to pricing and deliveries. Standard Engine will carry a complete stock of Continental gasoline, diesel, and LPG engines and power units. When additional space is acquired, facilities will be doubled and will include a complete engine-rebuild-

(Continued on next page)

YOU GET
VIBRATION-PLUS



WITH VIBRO·PLUS
INTERNAL VIBRATORS

. . . even "no slump" concrete flows easily!

Users call Vibro-Plus the most efficient of all internal vibrators. That's because its patented ROLLGEAR* Vibrating head steps up the 3600 RPM shaft speed to 11,000 to 15,000 VPM—does a more effective job of consolidation—with these *plus-values* . . .

—Astonishingly long service from shafts

—Easier lubrication (grease the shaft in 15 seconds, even while running — the head needs no lubrication ever)

—Lowest maintenance cost

—Handles the stiffest mix with ease

—6 months guarantee

Write for complete facts and name of nearest distributor.

*Reg. U. S. Pat. Off.

TYPE MRSB—Gasoline driven. *Furnished with 2½ or 4½ HP Wisconsin or Brigg & Stratton air-cooled engine on 360° swivel base, with foolproof snap coupling for 20 or 30 ft. flexible shaft. No V-belt, no clutch, no gears. Rollgear vibrator head and shaft interchangeable for electric or pneumatic power if desired. Available with 1¾", 2 3/16", 2¾" and 4" diameter heads. Grinding attachments available.*

VIBRO·PLUS PRODUCTS, INC.
54-11 QUEENS BOULEVARD
WOODSIDE, L. I., NEW YORK

"...On the feet of Individuals."

Society advances on the feet of individuals. We Americans live under the highest standard ever achieved because we believe in and are permitted currently to practice three of the cardinal principles of progress—Invention, Research and COMPETITION.

Nineteen basic inventions influence our pattern of life today. Each one was created to satisfy a fundamental need for improvement—a modern means of competing as against outmoded procedure. Each one, such as the electric light, the telegraph, the amplifying tube, the induction motor, created a new industry in which numerous companies strove in free competition for the maximum share of business.

For example, since Thomas Edison invented the incandescent filament lamp in 1880, the electric light industry has grown to an annual volume of $501,500,000 in light bulbs alone; in May, 1906 the Wright Brothers received the patent for their flying machine; the value of aviation manufactures in 1951 in the United States alone was estimated at $3,350,000,000 and in February, 1952, records show a $10½ billion backlog of orders.

More rapid still is the growth of the radio-television industry which today produces some $230 million worth of home radio sets and $1,570,800,000 in television sets. In every case, employment and sales volume grew enormously and the public enjoyed huge personal benefits.

Side by side with Invention came Research, exemplified by the competition of intelligent men questing for new materials, new methods, new processes, new scientific truths. Current advertisements tell of hundred-year tests to assure better materials for the future, technology that produces metals to withstand almost inconceivable heat, machines calculating 20,000 times faster than the mind of man, medicines that cure "incurable" diseases, food processes that cook, sterilize and pack hundreds of cans a minute. And in every case, the public enjoys huge personal benefits.

This is what James A. Decker undoubtedly had in mind when he wrote the line, "Society advances on the feet of individuals." These "individuals" are you and I, all our countrymen, benefiting every day from Invention, Research—and from COMPETITION.

Developing inventions, marketing products, and pursuing scientific research require substantial investments. A grave danger to their future now looms. In 1951, corporation net profits suffered a loss of 21% over the previous year. The reason—taxes too high, government controls and policies that interfere too greatly with private industry. If this continues, financial resources will dwindle, competition will be stifled.

Without free competition, American progress stops. No country can long exist when its government calls all the shots. We need competition to assure progress for people.

★ ★ ★

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

Distributor Doings

(Continued from preceding page)

ing shop manned by factory-trained mechanics, and a fleet of trucks for service in the field.

Pending appointment of its own manager, Bert Brandana, Manager of Continental's southwestern branch, will be in charge of the new distributorship.

New Distributor Handles Hyster

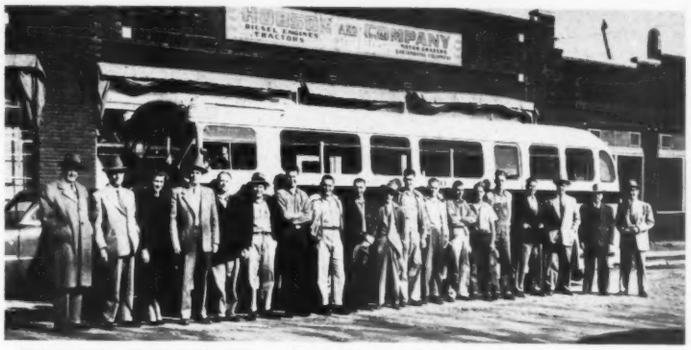
A new distributor firm, Industrial Handling Equipment Co., Cincinnati, Ohio, has taken over the distribution of the lift trucks, mobile cranes, and other equipment manufactured by Hyster Co., Portland, Oreg. The counties included in Industrial's territory are as follows:

In Ohio: Muskingum, Perry, Hocking, Mercer, Darke, Preble, Butler, Hamilton, Auglaize, Shelby, Miami, Montgomery, Warren, Clermont, Clinton, Green, Clark, Champaign, Logan, Union, Brown, Madison, Fayette, Highland, Adams, Delaware, Franklin, Ross, Pickaway, Licking, Barefield.

In Indiana: Franklin, Ripley, Dearborn, Switzerland.

In Kentucky: Boone, Campbell, Kenton.

Bart Nordling, former Eastern Division Parts and Service Manager for Hyster, and Fred Schultz, former Hyster District Manager, are owners of Industrial. The new establishment will supply customers with machines, factory parts, and expert service.



Hobson & Co., Kansas City, Mo., chartered a bus to take 19 employees from its Kansas City and St. Joseph stores to the Red Cross Blood Bank in response to the Caterpillar Tractor Co.'s appeal for donors.

Blood Donors Respond to Appeal

The "Lifeline" blood-donation appeal launched by Caterpillar Tractor Co., Peoria, Ill., among its distributors has met with a fine response. Not only the distributors and their employees, but relatives and friends as well, were marshaled into the campaign, and during its opening week—April 7-12—almost 1,300 pints flowed into the Red Cross Blood Bank. Caterpillar distributors from all over the country were lining up to give their pint.

The company's initial effort took the form of a one-page full-color ad depicting a wounded soldier receiving a transfusion through the "lifeline". Great care was taken to make the picture realistic and the five members of Caterpillar Advertising Department who appear in the ad are all World War II veterans. They grew beards, rubbed burnt wood on their faces, and used genuine uniforms and equipment. The appeal is being widely distributed throughout the United States and is expected to meet with a welcome response

(Continued on next page)

Fred B. Lee, Yancey Bros., Atlanta, Ga., had two incentives. He is a World War II Navy veteran—and Nurse Jean Watkins was there to take care of him.

TRAILERS
Birmingham Low Bed

Above: Birmingham Trailer part of order for Atomic Energy Commission.

Standard models, or made to special design to meet your needs. Illustrated above is Model 131-16100 DLU, capacity 100 tons. This model is equipped with swinging side brackets, which increase 12' wide bed to 15' wide when brackets are extended. Frame electrically welded, open hearth steel shapes. Birmingham trailers give you greater load capacity, ease of handling and rugged wear.

See us or our Distributors for special designs, catalog and prices.

BIRMINGHAM MANUFACTURING COMPANY, Inc.
P. O. Box 1351, Birmingham, Alabama

PROVED LEADERSHIP in IGNITION

Fairbanks-Morse **SUPER SPARK** Magnetos and Battery Ignition Units have proved superiority and leadership over many years of service.

FIRST to build a simple compact battery ignition unit with coil inside the housing. **FIRST** to build magnetos and battery ignition units with standard flange to mount on tractors.

Specify Fairbanks-Morse and you specify the "best".

FAIRBANKS, MORSE & CO.
Magneto Division — Beloit, Wisconsin

FAIRBANKS-MORSE
A Name Worth Remembering

Four Major Facts about C&E Monthly

1. It carries more editorial material than any other monthly publication in the field.
2. It also carries a higher proportion of editorial to advertising content.
3. C&E Monthly carries more display advertisers than any other monthly, and,
4. More exclusive advertisers.

This leadership pays off in readership and produces inquiries and orders for advertisers. It helps explain why CONTRACTORS AND ENGINEERS MONTHLY carries more advertisers, and more exclusive advertisers than any other monthly in the construction market.

A 2-line inquiry will bring you the facts you want about the huge construction market.

Contractors and Engineers Monthly

the NEWSpaper of highway and heavy construction

470 Fourth Ave., New York 16, N.Y.

WYANDOTTE CHEMICALS

High Early
STRENGTH
in your concrete with . . .
WYANDOTTE
CALCIUM CHLORIDE

Wyandotte

Wyandotte Chemicals Corporation, Wyandotte, Michigan

Distributor Doings

(Continued from preceding page)

not only among Caterpillar's own distributor firms, but from the general public all over the country.

Feenaughty Personnel Changes

Frank D. Masner is the newly appointed Branch Manager of Feenaughty Machinery Co., Boise, Idaho, road-building and construction-equipment distributor. Edward Villeneuve is Office Manager.

Three New Distributors for Huber

Huber Mfg. Co., Marion, Ohio, has appointed three new distributors to handle its equipment:

Watkins-Aldridge Equipment Co., 912-916 S. State St., Jackson, Miss. Meeks Watkins is President, and the firm will handle Huber maintainers and tandem and 3-wheel rollers in central and southern Mississippi.

The Herman Brown Co., Inc., First and Sheridan Sts., Des Moines, Iowa. The firm's President is Herman M. Brown, and it will handle Huber's complete line of rollers and the Huber maintainer in central and eastern Iowa.

Coast Equipment Co., 444 Eighth St., San Francisco, Calif. President, William M. Nosman. Coast Equipment will handle the complete line of Huber road-maintenance equipment in about 50 counties in central and northern California.

Hedge & Mattheis—Correction

In the May issue of C&E Monthly (pg. 88) it was announced that Hedge & Mattheis Co., Boston, Mass., had taken over the distributorship of Pioneer Engineering Works equipment in the states of Massachusetts, Connecticut, and Rhode Island. By an oversight, two other states were omitted from the territory covered by this distributorship. Vermont and New Hampshire complete the list.

Onan Appoints Three Distributors

D. W. Onan & Sons, Inc., Minneapolis, Minn., manufacturer of electric generating equipment, has appointed three new distributors, as follows:

A. F. Shane Co., 440 S. Evaline St., Pittsburgh, Pa., will handle complete service and repair facilities in western Pennsylvania.

Koochook Co., Inc., St. Louis, Mo., will handle the general line of Onan products in eastern Missouri and southern Illinois and will continue to provide service facilities. This firm was formerly an established Onan service and parts center.

Motor Mercantile Co., Salt Lake City, Utah, a division of Strevell-Paterson Hardware Co., will retail Onan products through that company's hardware accounts in Utah and eastern Idaho. Motor Mercantile will be an authorized Onan service center for that area.

Shields Expands Chicago Branch

Shields Rubber Co., Pittsburgh, Pa., distributor of industrial-rubber products, has moved its Chicago, Ill., branch into larger quarters at 108-112 N. Clinton St. Jack V. Lanahan is Manager of the Chicago office.

Shields distributes the New York Belting & Packing Co. line of conveyor and elevator belting, hose, V-belts and flat transmission belts, and other mechanical rubber goods. It also handles the Dayton Rubber Co. line of rubber-covered rolls.

To Represent Link-Belt Speeder

D. F. Van de Roovaart is now serving users and distributors of Link-Belt Speeder equipment in Virginia, North Carolina, Tennessee, and Kentucky. His headquarters are in Lexington, Ky.

As a district representative for Link-Belt Speeder, he is working with the following distributors: Dempster Bros., Inc., Chattanooga, Knoxville, and Nashville, Tenn.; Southern Machinery & Supply Co., Roanoke, Va.; Taylor Machinery Co., Memphis, Tenn.; and Wilson Machinery & Supply Co., Lexington and Paducah, Ky.

Four New Dealers for Cleco

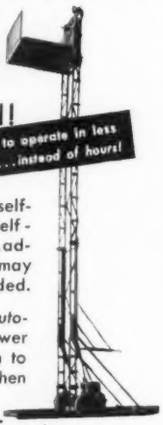
The Cleco Division of Reed Roller Bit Co., Houston, Texas, has added four distributors to the list of those handling the Cleco and Dallett lines of air tools and accessories: Charles H. Harden & Co., Inc., 2221 Fourth Ave. South, Seattle 4, Wash.; Highway Equipment & Supply Co., 21st & N. Sts., Lincoln, Nebr.; Long Beach Welders' Supply Co., Long Beach 13, Calif.; and E. W. Harman Co., 819 W. Fifth Ave., Columbus 8, Ohio.

Two Allis-Chalmers Distributors

The Oattis Electric Supply Co., Inc., 240 N. Front St., Memphis, Tenn., is a newly named distributor for Allis-Chalmers Mfg. Co., Milwaukee, Wis., in the following territory: Tennessee, west of and including Henry, Benton, Decatur, and Hardin Counties; Mississippi, north of and including Washington, Sunflower, Leflore, Carroll, Montgomery, Choctaw, Oktibbeha, and Lowndes Counties; Kentucky, south of and including Ballard, McCracken, Marshall, and Calloway Counties; Dunklin, New Madrid, and Pemiscot Counties in Missouri; and Arkansas, east of and including Marion, Searcy

(Concluded on next page)

NOW! BUCK gives you the only complete automatically-portable heavy-duty HOISTING MACHINE in the world!



Set up and ready to operate in less than 25-minutes . . . instead of hours!

Ready - rigged, self-erecting tower. Self-erecting to 40-feet, additional sections may be added if needed.

Wheels retract *automatically* when tower goes up . . . return to towing position when tower is lowered.

Raises 2000-pound load at rate of 100 feet per minute.

Pneumatic trailer mounted . . . finger-tip balance. Easily towed by pick-up truck.

Send now for complete specifications

Dealerships available

BUCK EQUIPMENT CORP.

208 Butler St., Cincinnati 2, Ohio

"BIG BITE" THE DIGGER FOR BIG HOLES

Here's 40-foot hole depth with 72" diameter . . . with speed and excellent performance. Positive digging all types earth.

Hydraulic raising, side leveling and 7½' transverse bit travel. Rugged mechanical finger-tip control. Uses full "power crowd" with cable pull-down. Variable bit speed, hi-speed dirt throw-off and reverse, driven through Twin Disc clutches off roller chain. All totally enclosed. Timken roller and RBC needle bearing equipped.

Manufactured by

HUGH B. WILLIAMS MFG. COMPANY

2946 Oak Lane Dallas, Texas

Distributed by JOSLYN SOUTHWEST COMPANY, Dallas, Texas

SELECT A Sterling THAT FITS YOUR JOB!

TUBULAR STEEL FRAME

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog No. 61.

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

12 SPOKE STEEL WHEEL

(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

PNEUMATIC TIRED WHEEL

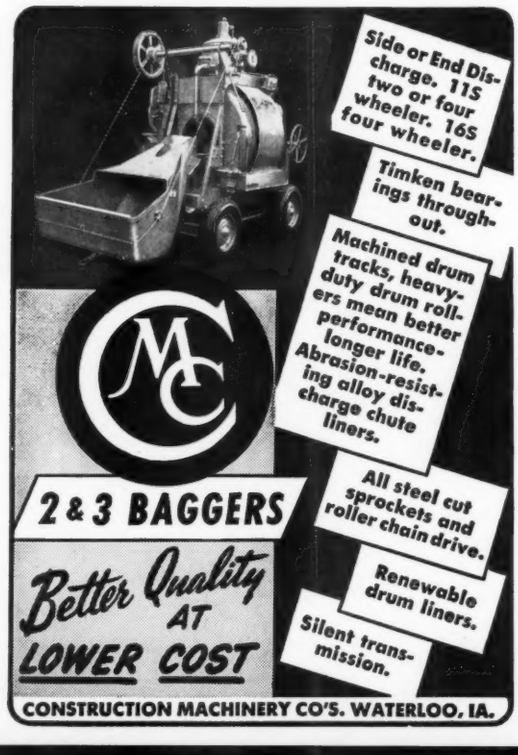
WOOD HANDLE BARROW

IMMEDIATE SHIPMENT

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS


Side or End Discharge. 11S two or four wheeler. 16S four wheeler.
Timken bearings throughout.
Machined drum tracks, heavy-duty drum rollers mean better performance-longer life. Abrasion-resisting alloy discharge chute liners.
All steel cut sprockets and roller chain drive.
Renewable drum liners.
Silent transmission.
MC
2 & 3 BAGGERS
Better Quality AT LOWER COST
CONSTRUCTION MACHINERY CO'S. WATERLOO, IA.

Distributor Doings

(Continued from preceding page)

Van Buren, Conway, Perry, Pulaski, Jefferson, Lincoln, Desha, and Chicot Counties.

James Oattis, Jr., is President of the distributor firm, which will handle Allis-Chalmers motors, controls, pumps, transformers, and Texrope drive equipment.

Another distributor is The Flushing Electric Corp., 45-07 162nd St., Flushing, N. Y., whose President is William Nager. Flushing Electric will handle Allis-Chalmers motors and controls in Queens, Suffolk, Nassau, Kings, Bronx, New York, and Westchester Counties in New York State.

New Distributor in Virginia

Salem General Equipment Co., Inc., Townsend Bldg., Lee Highway, W. Salem, Va., is a new distributor firm which handles LeTourneau equipment and allied lines in the state of Virginia. President of the company is Drayton C. Harrison, of General Supply & Equipment Co., Baltimore, Md.; Manager is William L. Townsend, Le Tourneau salesman in Virginia; Parts Manager is Blair McCurdy; and Service Manager is Edgar Maitland.

Rodenhausen Is St. Paul Dealer

St. Paul Hydraulic Hoist, Minneapolis, Minn., a division of Gar Wood Industries, Wayne, Mich., has appointed Rodenhausen Sales & Service Co., Philadelphia, Pa., as a distributor of the complete line of St. Paul hydraulic hoists, dump bodies, maintainer blades, and elevating end gates. Rodenhausen territory includes the counties of Philadelphia and Delaware, and areas of Bucks, Montgomery, and Chester Counties.

Cummins Diesel Sales Moves House

Cummins Diesel Sales Corp., part of the dealer organization of Cummins Engine Co., Columbus, Ind., held open house on June 10 in honor of its new headquarters at 401 Delancy St., Newark 5, N. J. Guests were shown over the modern testing, service, engine-rebuilding, and parts warehouse.

Cummins Diesel Sales Corp. has New York branches at the Bronx, Blasdell (Buffalo), and East Syracuse, and there are sub-dealers at Albany, Flushing, and Highland Mills.

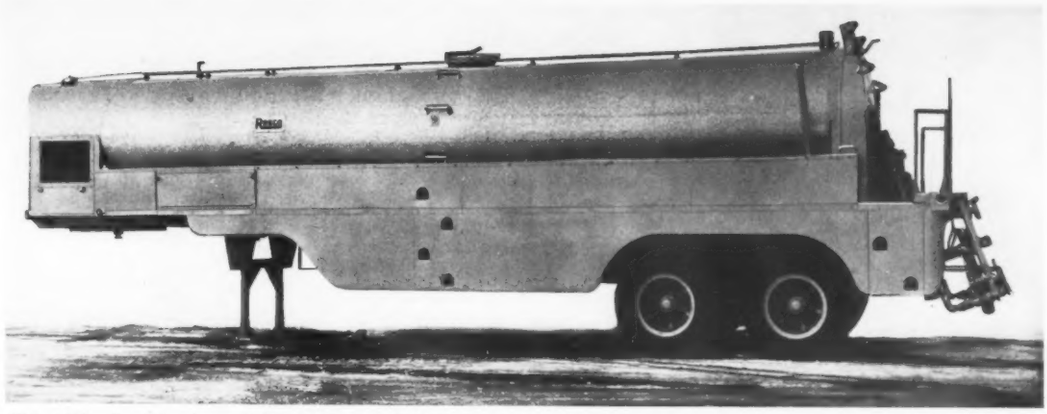
Hyster Has Mid-Central Manager

Wilton G. Smith is named a new District Manager in the mid-central territory for Hyster Co., Portland, Oreg., manufacturer of industrial lift trucks and tractor equipment. He will work with Hyster dealers in the territory: C. H. Ellis Co., Indianapolis, Ind.; Embry Bros., Inc., Louisville, Ky.; and Ortner Co. and Industrial Handling Equipment Co., Cincinnati Ohio.

McNall Handles Joy Equipment

McNall Machinery & Supply Corp., 600 D Ave., N. W., Cedar Rapids, Iowa, is a newly appointed distributor for Joy Mfg. Co., Pittsburgh, Pa., manufacturer of air compressors, wagon drills, hand-held drills, paving breakers, spaders, tampers, and portable hoists. The territory McNall covers for Joy equipment includes a major portion of the state of Iowa and part of Illinois.

REMEMBER
Sell or Buy Used Equipment.
Acquire experienced help.
Send your copy to
The Trading Post
Contractors & Engineers Monthly
470 Fourth Ave., New York 16, N. Y.



This 4,000-gallon bituminous distributor is one of the largest ever built by Rosco Mfg. Co., Minneapolis, Minn. Specially designed for Contractor Myrl Clark, Tyndall, S. Dak., the fully enclosed streamlined Model RQE-TT is a "frameless" semitrailer with a tandem-axle construction. It is equipped with an 180-foot fully circulating Rosco spraybar.

Silicone Water Repellent

A silicone water repellent for exterior concrete and above-grade masonry is covered in a folder issued by L. Sonneborn Sons, Inc., 80 Eighth Ave., New York 11, N. Y. Colorless Hydrocide SX can be applied by brush or spray. It is said to minimize efflorescence and provide a barrier to capillary moisture behind the surface.

For most surfaces one coat is enough. The coverage is usually 75 to 100 square feet per gallon, depending on the porosity.

This literature may be obtained from the company, or by using the Request Card bound in at page 16. Circle No. 276.

Concrete Pipe Company News

William H. Sprang is a recently appointed Sales Engineer in the Pittsburgh, Pa., branch of Universal Concrete Pipe Co., Columbus, Ohio. Prior to joining the company, Mr. Sprang was Right-of-Way Acquisition Agent in the Illinois Division of Highways.

Universal has opened a new plant at Jessups, Md., 12 miles southwest of Baltimore, for which the Columbus Machinery Division has sent complete equipment for producing 6 to 72-inch pipe. In addition to round sewer and culvert pipe, the 13-acre Jessups plant will make flat-base pipe for pedestrian and cattle passes, special pipe for utility galleries and manholes, reinforced-concrete river weights, and open and closed-face concrete cribbing. Harold Leuliette, Manager of Universal's Norristown, Pa., plant, is in charge at Jessups; Frank Bartrug is Production Manager; and Henry W. Gadde is Sales Representative.

THESE PENGO PRODUCTS SAVE YOU MONEY!

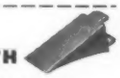
THE PENGO EARTH AUGER

★ Twin helix—no back thrust!
★ Bores true, clean holes in any soil, most sandstones and hardpans, frozen ground, permafrost!
★ All wearing parts replaceable on job!
★ Made in 15 sizes, 10" to 54" hole diameters, to fit all makes of heavy-duty earth boring machines. Larger sizes on order.

THE PENGO CUTTING HEAD

★ Easy installation—welds to your present helix.
★ Bores where you never could before!
★ Wearing parts are replaceable on the job and are interchangeable with PENGO Auger parts. *(Described at left.)*
★ Made in 9 sizes, 8" to 24" diameters. Larger sizes on order.

THE PENGO WISDOM TOOTH



★ All PENGO Augers and Cutting Heads are equipped with the drive-on PENGO Wisdom Tooth, specially designed for use on earth augers; cast from special abrasion and shock-resistant steel alloy for *far* longer service life!

"Get the PENGO WISDOM TOOTH—It knows how to bore holes!"

ORDER TODAY—OR SEND FOR LITERATURE, PRICES

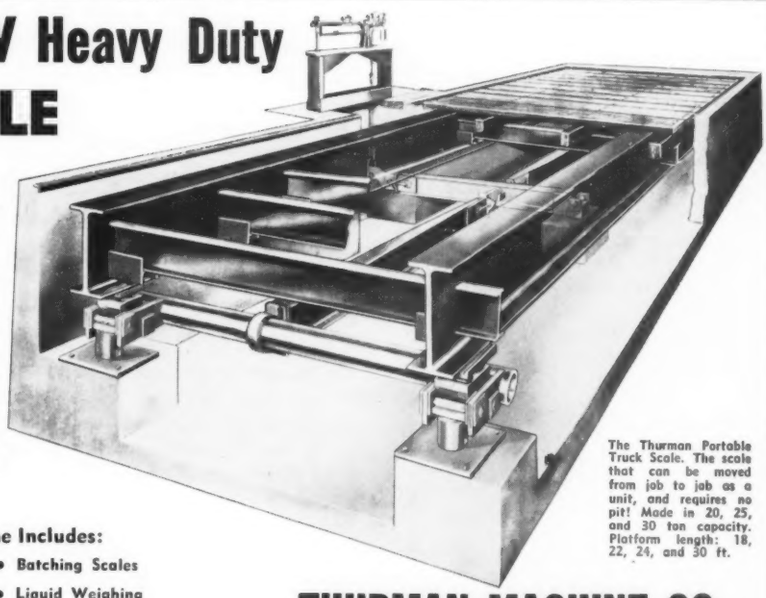
PETERSEN ENGINEERING CO.
MANUFACTURERS
SANTA CLARA, CALIFORNIA

THURMAN Heavy Duty PIT SCALE

Platforms:
18 to 50 Feet

Capacities:
20 to 50 Ton

Built to rigid U. S. Bureau of Standards specifications. Pivots and bearings of fine heat-treated steel, electroplated to resist corrosion. Castings and forgings are oversize for safety. I-beams and cross members are extra heavy structural steel. Pit preparation blue prints are furnished.



The Thurman Portable Truck Scale. The scale that can be moved from job to job as a unit, and requires no pit! Made in 20, 25, and 30 ton capacity. Platform length: 18, 22, 24, and 30 ft.

The Thurman Line Includes:

- Portable Motor Truck Scales
- Batching Scales
- Liquid Weighing Scales
- Pitless Scales
- Wheelbarrow Scales
- Warehouse Scales
- This and other weighing equipment in sizes to fill your requirements.

THURMAN MACHINE CO.
Scale Division
Established 1918
156 North Fifth Street Columbus 15, Ohio

A workman of Arthur G. McKee Co., of Cleveland, uses a Nu-Matic grinder to polish pipe ends before joining.

Air-Inflated Wheel Polishes Pipe Ends

An air-inflated wheel designed to polish pipe ends (preparatory to joining) with no undercutting or grinding flats is announced by Nu-Matic Grinders, Inc., 8224 Carnegie Ave., Cleveland 3, Ohio. The Nu-Matic grinder consists of a 5-inch-diameter rubber drum with a 3½-inch surface. The drum is mounted on a flange with either a ½ or ⅝-inch arbor. The operator slips an abrasive belt over the drum and then inflates the drum with from 3 to 10 pounds of air; the company recommends 5 to 6 pounds for polishing pipe ends.

The wheel can be used with any kind of power tool for any type of polishing job, the company claims. Changing belts is quick and easy. The resiliency of the wheel is said to increase abrasive contact area, eliminate chatter and bounce, and permit polishing of contours efficiently and safely.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 329.

Road-Sweeping Magnet

A line of road-sweeping magnets for picking up nails and tramp iron from highways, parking lots, and airport runways is announced by The Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland, Ohio.

The steel units are light in weight and have special eyelets so they can be attached to the truss-type structure on the front of trucks or Jeeps. In most installations, the magnet supporting structure can be raised or lowered from the driver's position. A portable gasoline-driven generator energizes the magnet controller and both units are mounted in the truck. The switch is located on the vehicle instrument panel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 300.

The switch for this Ohio Electric road-sweeping magnet is on the truck or Jeep instrument panel.

Convention Calendar

August 21-24—Seabee Convention
Annual National Convention, Seabee Veterans of America, Schroeder Hotel, Milwaukee, Wis. Convention Chairman, Clay Fralick, 815 W. Wisconsin Ave., Milwaukee 3, Wis.

October 20-24—National Safety Congress
National Safety Congress, National Safety Council, Chicago, Ill. Construction Section Meetings, October 21-22, Conrad Hilton Hotel. Howard Warzyn, Staff Representative, Construction Section, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

December 9—Concrete-Producers Meeting
Eighth Annual Convention, New York State Bituminous Concrete Producers Association, Hotel Statler, Buffalo, N. Y. Gus Rayner, Executive Secretary, Box 667, Albany, N. Y.

New Governing Brake

A governing brake for use with electric or gasoline winches or similar power units has been developed by St. Anthony Machine Products Co., 2424 E. Franklin Ave., Minneapolis, Minn.

Operating on a centrifugal governing principle, the brake delivers a smooth, gradual, retarding action at any desired interval within a range of 900 to 4,000 rpm and automatically checks the speed of a free-falling or free-running load. Engaging speed is set at the factory to the user's specifications.

Cast-aluminum shoes with a bonderized molded lining present a braking surface of 26.5 inches; an aluminum-magnesium housing with radial fins insures high heat transmission.

The governing brake is primarily designed for shaft mounting, but is adaptable to special assembly requirements. Outside radius of the housing, including fins, is 9 inches; over-all height with a floor-type mount is 11 7/16 inches; cross-section width is 2 11/16 inches. The brake is also available with a flange-mounted housing.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 321.

Data on Induction Motors

Construction features, ratings, and dimensions of open drip-proof and splash-proof squirrel-cage induction motors in ratings of ½ to 100 hp are described in a new bulletin released by Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee, Wis.

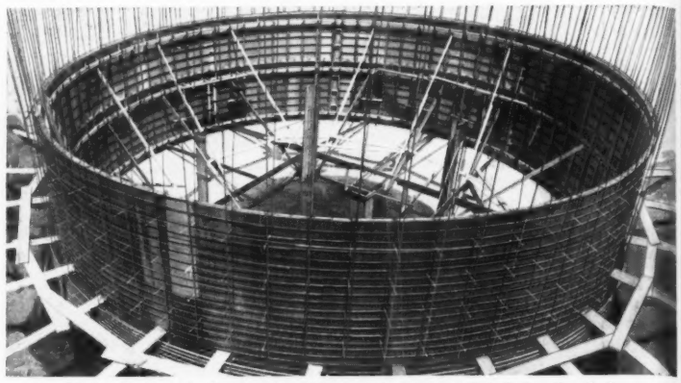
This literature may be obtained from the company by requesting Bulletin 51B6210D, or by using the Request Card at page 16. Circle No. 313.

Data on Aluminum Conveyors

An aluminum trough belt conveyor is covered in a bulletin issued by G. N. Crawford Equipment Co., 6714 Kelly St., Pittsburgh 8, Pa. The unit features antirust construction, light weight, a clean-out and a scraper at both ends and antifriction troughing carriers.

Powered by air or electric motors, the conveyor is made in 12, 16, and 20-foot lengths. It comes with handles for easy carrying.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 328.



Setting Up Forms for Sewage Disposal Tank, St. Louis County, G. L. Tarlton Co., G. C.

Symons Forms for Curved Walls

Symons Rib panels are used with V-shaped fillers at each joint. Wedge-bolts secure the 3 pieces together and also hold the ties in place. Curved walers or 1"x6" flat walers may be used for alignment.

Contractors report savings of $5,000.00 on forming costs of Sewage Disposal Plants.

Symons offers a complete engineering service. Send plans for your next job and get complete layout and cost sheet — no obligation. *Symons Clamp & Mfg. Co., 4251-G2 Diversey, Chicago 39.*

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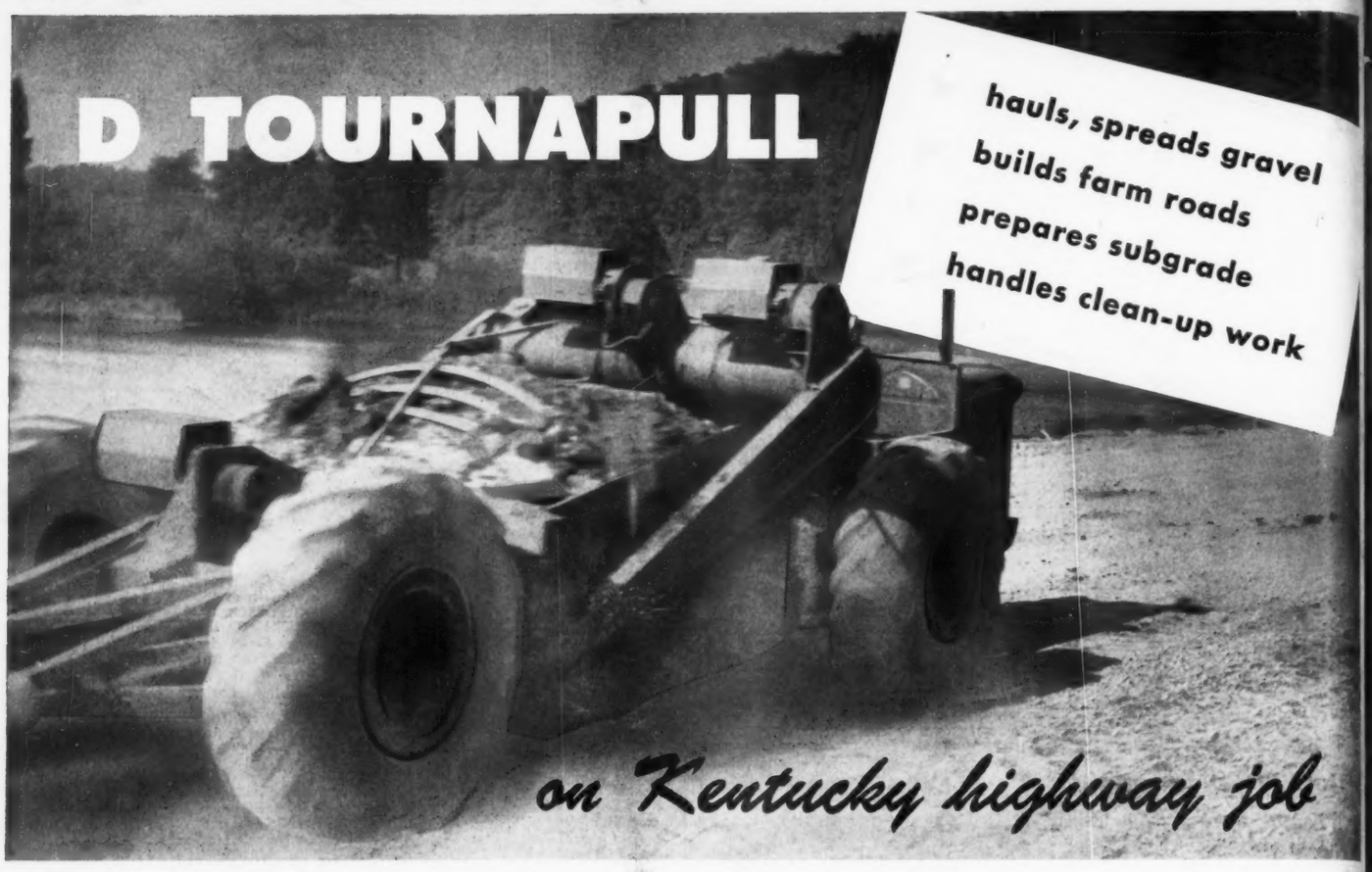

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